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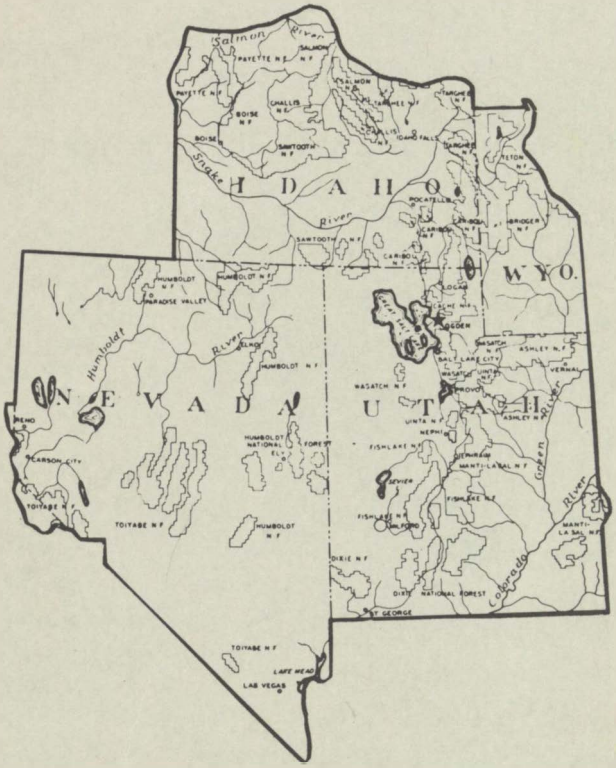
BLACK HILLS BEETLE CONDITIONS

FOREST SERVICE REGION 4

November 1964



DIVISION OF TIMBER MANAGEMENT

Forest Service
U. S. Department of Agriculture
Ogden, Utah

BLACK HILLS BEETLE CONDITIONS IN LODGEPOLE PINE FOREST FOREST SERVICE REGION FOUR

November 1964

INTRODUCTION

This report presents current information on infestations of the Black Hills beetle, (Dendroctonus ponderosae Hopk.) formerly referred to as the mountain pine beetle, Dentroctonus monticolae Hopk., in lodgepole pine and ponderosa pine stands on lands of all ownerships in the territory covered by the U. S. Forest Service, Region Four. The Intermountain Region (Four) territory encompasses all the states of Utah, Nevada, the western half of Wyoming, and all of southern Idaho.

There has been a general increasing trend in populations of the Black Hills beetle in lodgepole pine stands of Region Four since 1954. This year, over two million lodgepole pine are infested in epidemic centers compared to slightly more than 500,000 in 1963. The infestations have followed the general pattern of starting as small, widely scattered groups of trees that have consolidated and increased in size until now many contain from a few thousand to several hundred thousand infested trees. Each year since 1954 control action has been carried on against one or more of the most aggressive infestations. Control has been effective in materially reducing the loss of trees on the lodgepole pine outbreak on the Wasatch National Forest and has been responsible for the decline of some smaller outbreaks. The decline of some outbreaks can be attributed to natural factors.

Data collected for prediction purposes include measurements of population densitites of bark beetles, and other biological and environmental factors that might alter the course of bark beetle populations.

Because of the large number of infestations in the Region, it was not possible to obtain the data desired from all outbreaks. Consequently, it was necessary to depend, at least in part, on entomological experience and judgment to predict the future trend of some outbreaks.

A discussion of the infestations in alphabetical order by National Forests or Parks and for all other lands by states follows. Maps showing the location of the infestation centers follow the discussions of the infestations for each Forest area.

CURRENT CONDITIONS

Ashley National Forest

Black Hills beetle activity in lodgepole and ponderosa pine stands persisted at epidemic levels on the Ashley National Forest from 1956 to 1962. The trend started downward in 1962 and continued through this year. In many areas this downward trend can be attributed to natural factors. However, treatment for the last two years undoubtedly accelerated the beetle decline in some areas.

In Pipe and Spruce Creeks, fall operational surveys showed approximately 270 newly infested ponderosa pine. These trees were treated this fall. Trees in all other areas surveyed occur as singles or in widely scattered small groups.

Epidemic beetle populations probably still persist in the Oweep Creek-Lake Fork Drainage of the High Uinta Wilderness Area. An evaluation was made this fall of the timbered benches to the west of the main Oweep Creek infestation to determine if the infestation had spread from these benches to adjacent timbered areas to the west. Examination of infested trees and recently killed trees in this area showed characteristics of endemic populations. A single small "hot spot" was found in East Basin where only 20 newly attacked trees were found. In our judgment this small "hot spot" does not appear to constitute a threat to any timber other than a few mature and overmature lodgepole pine in the immediate vicinity of trees now infested. Therefore, it does not appear that in the near future the Oweep Creek infestation will spread rapidly to the west.

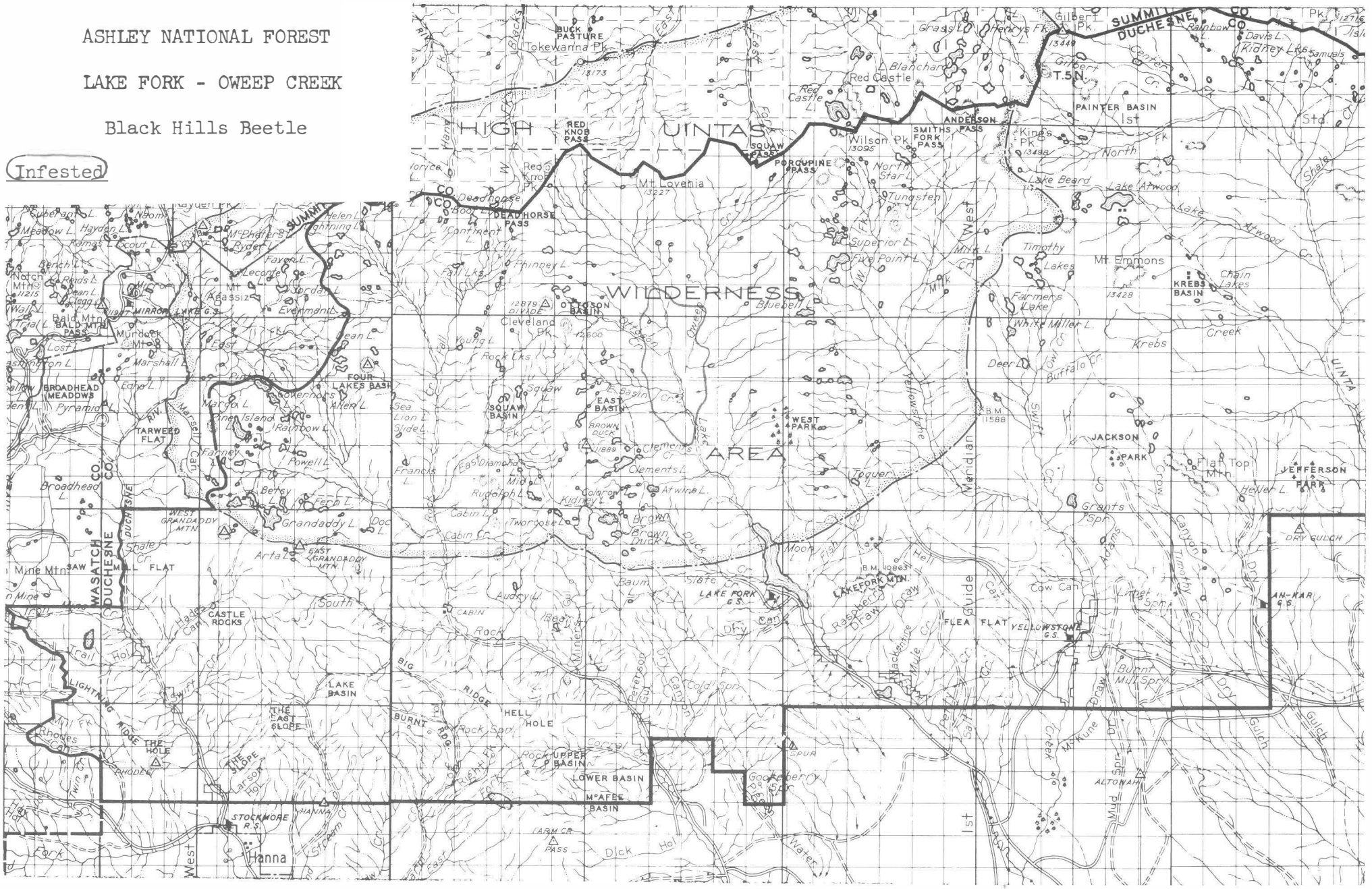
We believe the decreasing trend in all areas outside the Wilderness Area will continue at least through next year.

ASHLEY NATIONAL FOREST

LAKE FORK - OWEEP CREEK

Black Hills Beetle

Infested



Boise National Forest

A Black Hills beetle infestation in second growth ponderosa pine is still active north and south of Warner's Pond in the Big Creek Drainage southeast of Cascade, Idaho. This year approximately 2,000 ponderosa pine faders were detected in this area.

Brood densities in 1963 averaged 107 per square foot with an attack density of 6.1 per square foot. This year brood and attack densities averaged 114.2 and 7.3 per square foot respectively. This shows only a slight increase in brood and attack densities over 1963. Infested trees were larger this year than last year.

Populations of a predacious fly, Medetera sp., increased from 1963 to 1964. This year, these predators averaged 42.2 per square foot of bark sample.

In 1963 it was observed the mature larvae, pupae, and callow adults were present in November, some of which matured through the winter and produced an early attack in 1964. There was also a normal attack period in July and August. Two attack periods in a single season are uncommon in Region Four. Late fall examination of trees showed a brood density of 15.6 for callow adults and 5.6 for pupae per square foot. Therefore, it is possible there may again be an early attack in the spring of 1965.

From the entomological viewpoint it is felt that the infestation will continue at about the same level through next year. However, since there is a high incidence of Medetera sp., this infestation will need to be examined periodically to determine if this predator might in the future exert a controlling influence.

Bridger National Forest

Black Hills beetle continues to be active in several localities on the Bridger National Forest. Aerial survey personnel estimate in all infestations approximately 4,600 lodgepole pine trees were killed this year, compared to an estimated 2,000 trees killed in 1963.

Bridger Division

On the Bridger Division the Black Hills beetle has been active the last few years on the north and southwest sides of the New Fork Lakes, northwest of Willow Creek Guard Station, and around Willow Lake. No newly infested areas of any significance were detected in 1964.

Early spring examinations of the infestation north of New Fork Lakes showed relatively high brood densities in approximately 600 trees. Later in the spring, Bridger National Forest personnel treated 692 trees in this area. Fall examinations revealed less than 50 newly infested trees in the treated area. Many of the trees sampled this fall had Ips associated with the Black Hills beetle. This infestation is now at a low level and probably will return to an endemic state.

Aerial observers report a general increase in faded lodgepole pine south of New Fork Lakes on National Forest and Bureau of Land Management lands. Some infested trees were treated in 1964 on Bureau of Land Management lands in this vicinity.

The infestation on the north shore of Willow Lake did not decline as expected but maintained itself by moving eastward. In addition, there was an increase in faded trees on the south shore. Entomologists examined these infestations and estimate approximately 800 to 1,000 trees are currently infested. It is expected this infestation will continue as an epidemic and may enlarge in size. The small infestation near Willow Creek Guard Station was examined in the spring and while 50 infested trees were found, the infestation appears to be of an endemic nature. An increase in the occurrence of faded lodgepole pine scattered in small groups near Fremont Lake was detected by the fall aerial survey. No ground examinations were made in this area.

Wyoming Division

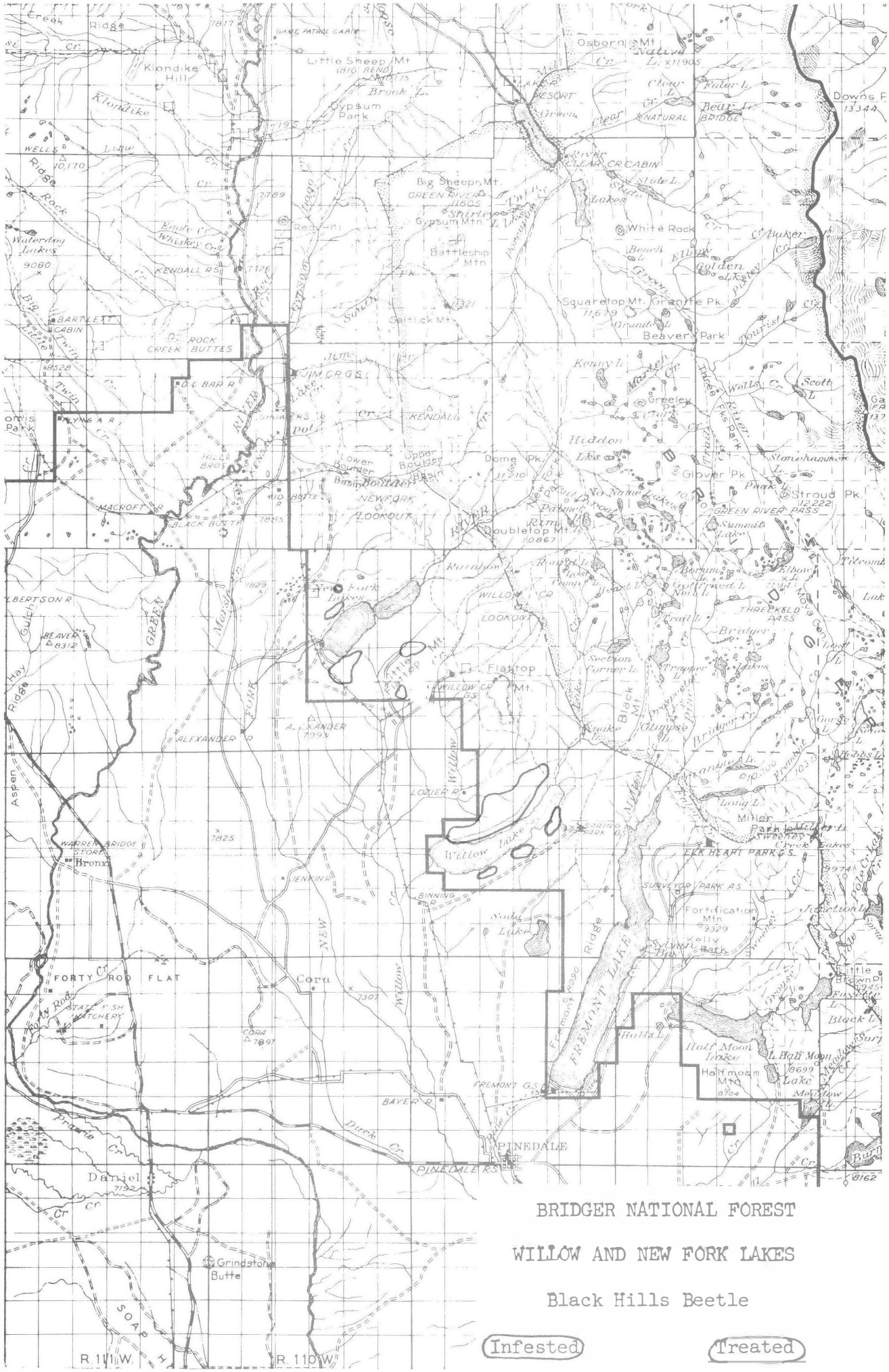
Black Hills beetle activity appears to be increasing in the Greys River Drainage on the Wyoming Division. Some of the infestations centers have increased at a 2:1 buildup ratio since last year. Many of these infestations have existed for two or more years and have been reported in previous condition reports.

A general description of the new centers of Black Hills beetle activity detected from the air this fall follows. There are groups of currently faded lodgepole pine in many side drainages of the west facing slope of the main Greys River Drainage between Forks of the Greys Guard Station and Blind Bull Creek. One of the largest groups is located near the mouth of Deadman Creek.

Across the Greys River on the east facing slope faded lodgepole also occur in groups, most of which are located in Murphy Creek. Groups of faded lodgepole pine are also located on the east facing slope in many of the side drainages between Elk Creek and Corral Guard Station. The largest group lies on a bench between North Three Fork Creek and Mid Three Fork Creek. Approximately 300 trees were killed this year in an infestation located in the Little Greys River a few miles above the Forks of the Little Greys Guard Station. This infestation has apparently taken most of the suitable host material from the mixed stand of lodgepole pine and Douglas-fir in the area. However, it appears there is enough suitable host left in the immediate area to sustain the infestation for at least another year. In West Bailey Creek the Black Hills beetle killed approximately 150 trees this year. There has been no noticeable increase in the number of trees killed for each of the last two years. Unfortunately, it was not possible to evaluate any of the infestation in the Greys River or West Bailey Creek Drainages.

Entomologists found infested trees to be widely scattered and brood densities relatively low in a reported Black Hills beetle infestation in Grover Park near Afton, Wyoming. This infestation poses no immediate threat to surrounding timber.

A biological evaluation of the Spring Creek infestation located along Highway U. S. 89, south of Afton, Wyoming, showed brood density indicative of epidemic conditions. However, only 80 to 100 trees were infested. Logging of infested trees has reduced the beetle population. Additional logging scheduled for this fall should reduce the population to a low level.



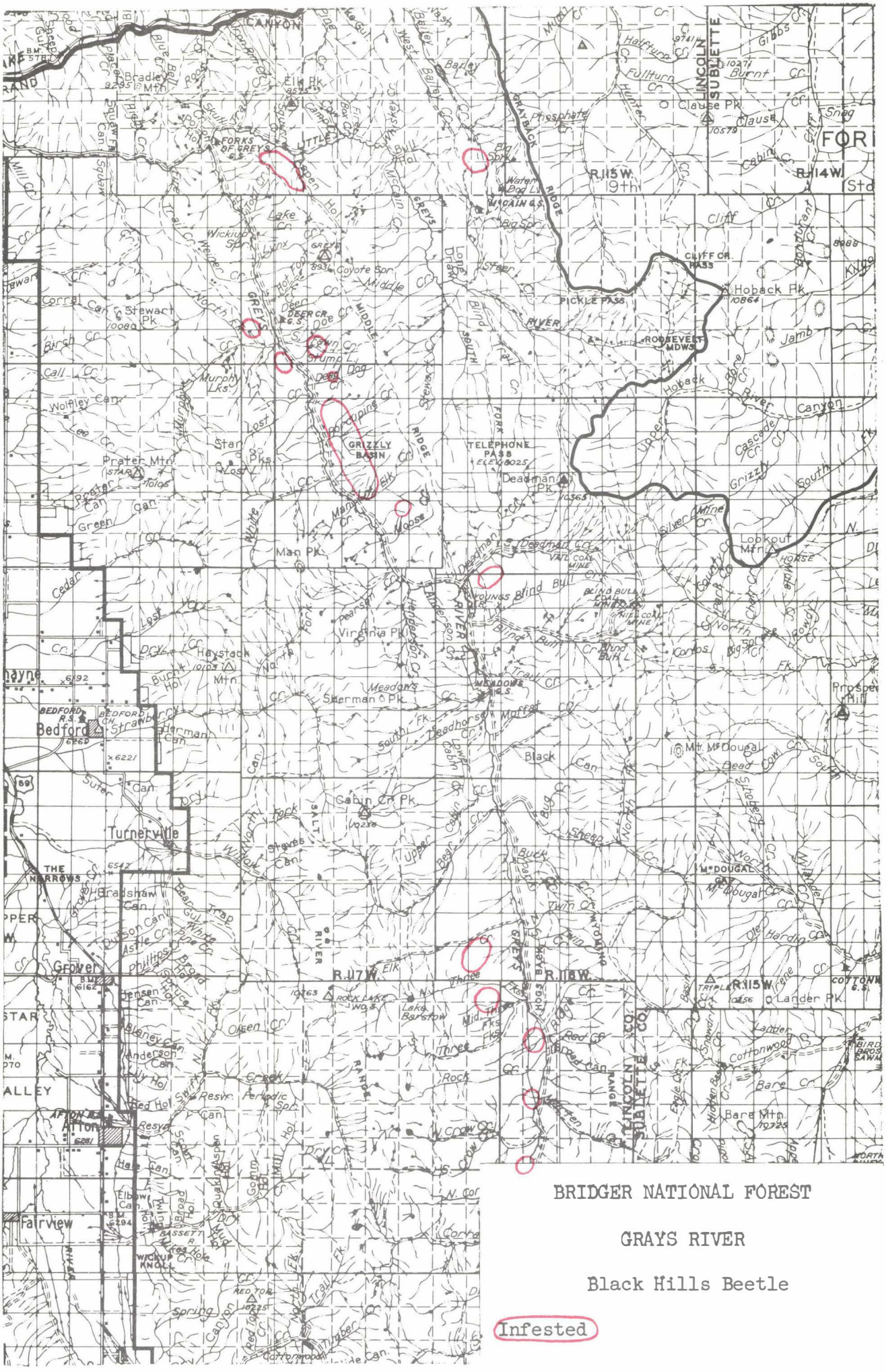
BRIDGER NATIONAL FOREST

WILLOW AND NEW FORK LAKES

Black Hills Beetle

Infested

Treated



BRIDGER NATIONAL FOREST

GRAYS RIVER

Black Hills Beetle

Infested

BRIDGER NATIONAL FOREST

HAMS FORK CREEK

Black Hills Beetle

Cache National Forest

Epidemic populations of the Black Hills beetle have been present in lodgepole pine stands on the Cache National Forest for several years. During the last two or three years, many of the infestation centers have increased at an alarming rate and have killed large numbers of trees. A suppressive program was initiated this year in all large infestations and in some smaller infestations located in high resource value areas. Cache National Forest personnel report 20,627 trees were treated.

In the large infestation in Dry Canyon-Temple Flat area southwest of Meadowville, Utah, 10,800 trees were treated this spring. Fall examinations indicate that while the momentum of the outbreak has been greatly reduced through treating, the remaining beetle population is still epidemic. Therefore, additional treating will be necessary next year in and around the area treated this year to forestall a rebuildup of Black Hills beetle.

The Eight-Mile Creek infestation located about 12 miles south of Soda Springs, Idaho, has maintained itself over the last five or six years by killing small numbers of lodgepole pine each year. However, part of the infestation is located in a recreation area where yearly drain on timber is beginning to affect campground and other recreation values. Spring treatment of 544 infested trees has reduced the beetle population to a low level. In all likelihood this infestation will not show increasing tendencies for the next few years.

The infestation centers existing in Mill Hollow and South Wilson-Sotter Creeks, side drainages of Eight-Mile Creek, were not examined this year. No suppressive action was attempted in these infestations. Aerial observers report less fading in these areas than was noticed in 1963. However, the present status and trend of these infestations cannot be determined until ground examinations are made.

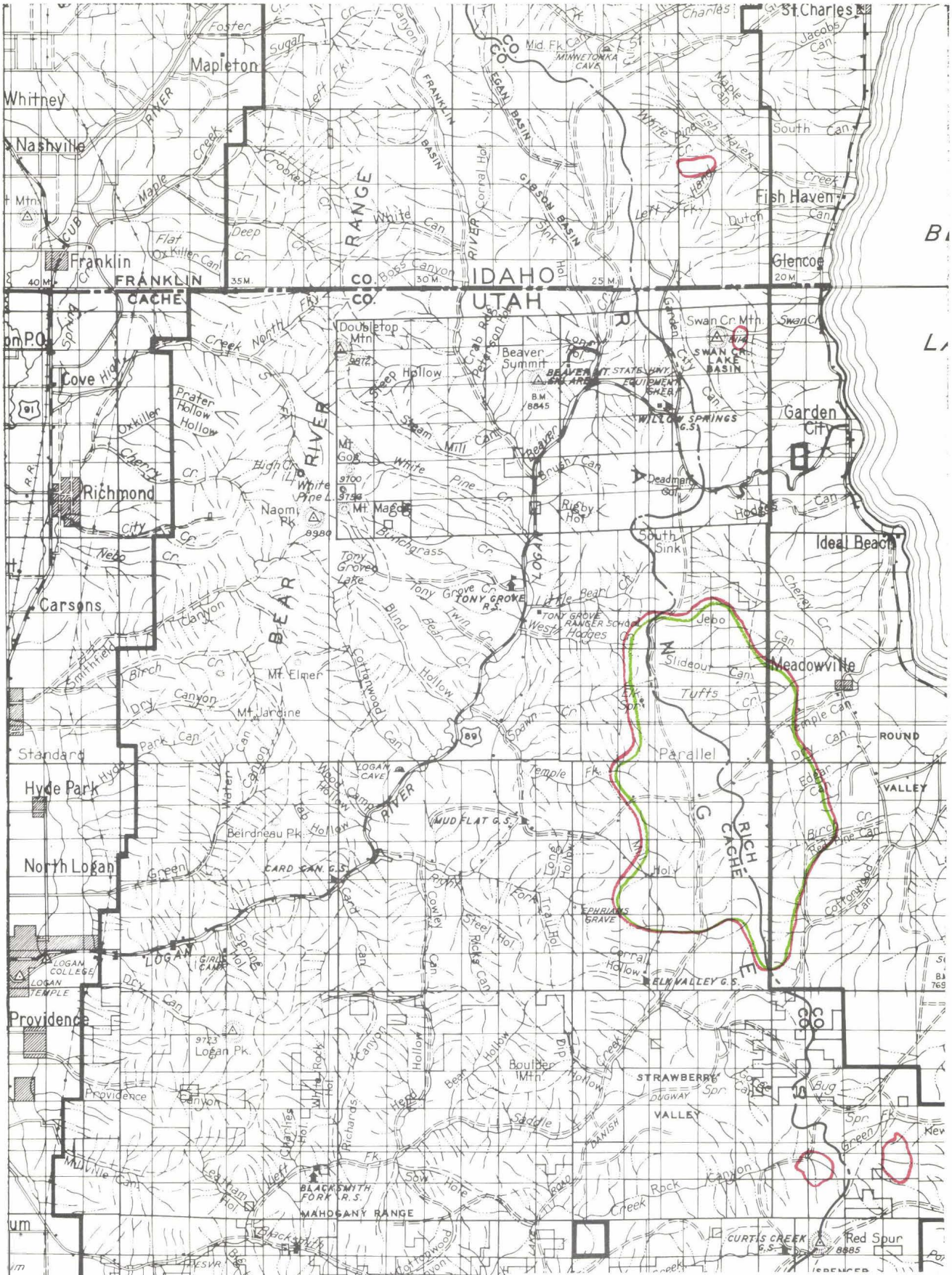
This spring 4,770 infested trees were treated under contract in Skinner and Pearl Creeks. An additional 1,413 trees were treated by force account crews in neighboring Coop and Stauffer Creeks. These areas had experienced explosive buildups in fall of 1963. Fall examinations in Skinner Creek showed that effective control was accomplished in most of this area, but some treating will be necessary next year to prevent future buildups of the Black Hills beetle.

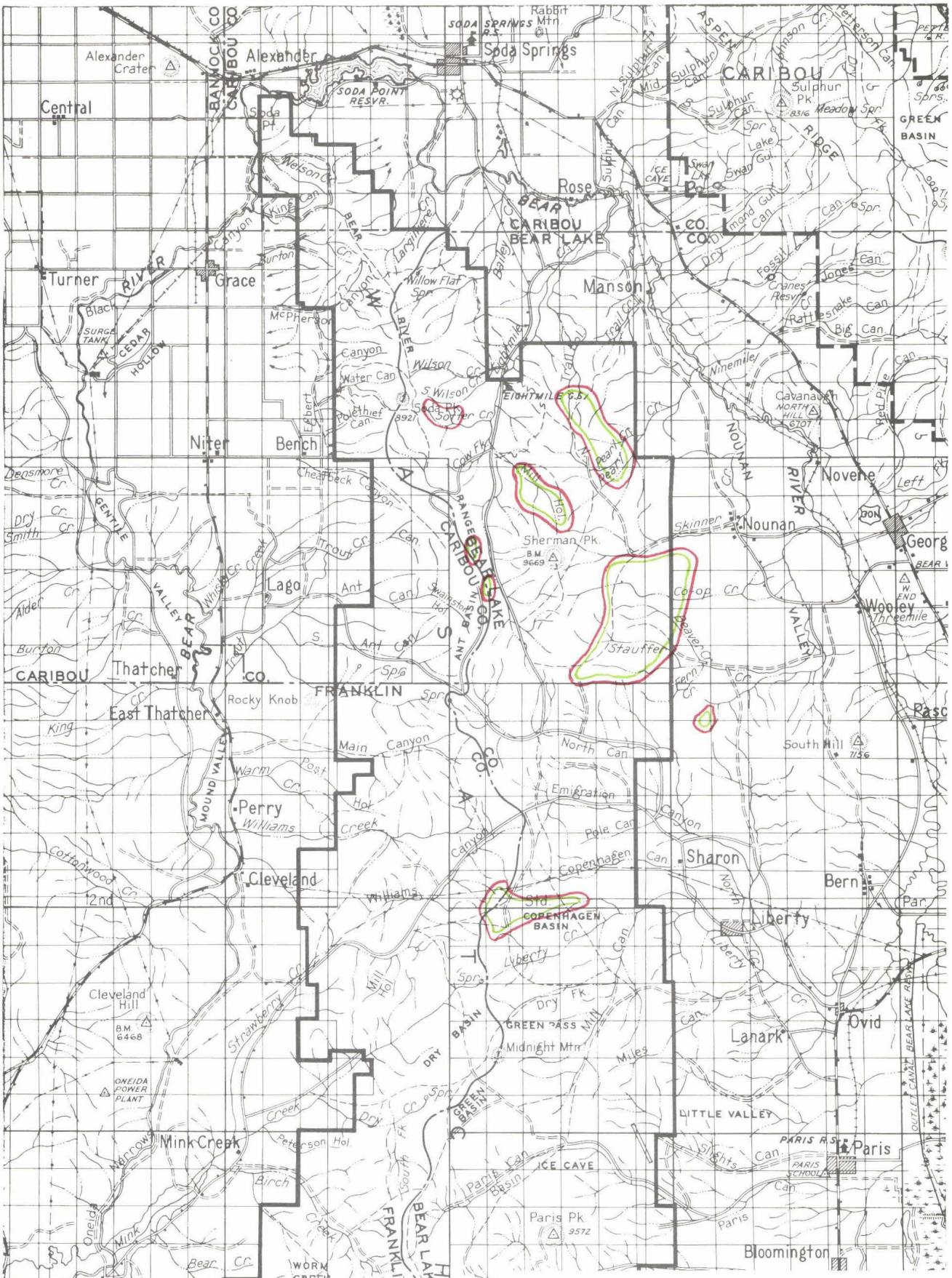
In the infestation located along the Emigration Canyon road and in Copenhagen Basin, west of Liberty, Idaho, 1,700 trees were treated this year. Examinations made this spring before the area was treated showed brood densities averaging over 215 larvae per square foot of bark area. This fall brood densities averaged 145 per square foot in newly attacked trees. The fall brood densities are lower than what is normally considered to constitute epidemic conditions; however, a followup treating program appears desirable to further reduce the threat of this infestation.

A small infestation in Trail Hollow, south of Soda Springs, Idaho, was treated this year. Altogether, 920 infested trees were sprayed. Fall operational surveys estimate there are now 200 infested trees which need treatment to further reduce this potentially serious infestation.

In summary, suppressive action was undertaken on all the large infestations of Black Hills beetle on the Cache National Forest. Over 20,000 trees were treated this spring. Fall examinations made in and adjacent to many of the treated areas showed sizeable reductions in the number of newly attacked trees. Fall operational surveys estimated only 7,420 currently infested trees in epidemic centers.

Unless treatment is carried on again next year, it is likely an increased number of lodgepole pine will be lost in the present epidemic centers.


CACHE NATIONAL FOREST
MEADOWVILLE
Black Hills Beetle
Infested
Treated



CACHE NATIONAL FOREST

STAUFFER AND SKINNER CREEKS

Black Hills Beetle

Infested

Treated

Caribou National Forest

The Black Hills beetle has been epidemic on the Caribou National Forest for the last three years. A few new areas and extensions of old known infestation centers were found during the annual aerial detection survey. Five definite centers of epidemic populations of the Black Hills beetle are now present in the lodgepole pine stands of the Caribou National Forest.

Surveys conducted by Caribou National Forest personnel show that 3,000 trees are currently infested on 1,000 acres in Diamond Flat west of Freedom, Wyoming. Fall brood densities were high, averaging 247.2 per square foot of bark area, and the ratio of new attacks to "red tops" was 3:1. The average DBH of infested trees was 16.0 inches. This infestation is classed as epidemic and is expected to continue through next year.

Approximately 2,400 infested trees were treated this year in the Crow Creek infestation east of Georgetown, Idaho. Ground observers estimate that there are approximately 1,000 currently infested trees scattered throughout this infestation. Brood densities averaged 226.6 per square foot. Average DBH of infested trees was 12.0. Buildup ratio appeared to be two new attacks for each "red top." The epidemic trend will likely continue at least through next year.

There are 1,000 - 1,500 infested lodgepole pine on approximately 1,500 acres in Antelope, Garden, and Pritchard Creeks on the very north end of the Caribou National Forest. In this epidemic broods averaged 223.6 per square foot, and the infested trees averaged 13.0 inches DBH.

On Sulphur Peak, directly east of Soda Springs, Idaho, there is a relatively new infestation of Black Hills beetle covering approximately 1,000 acres. New attacks are in overmature and mature lodgepole pine, averaging 17.2 inches DBH. Brood densities averaged 195.6 per square foot. The infestation is classed as epidemic, and there is no indication of a downward trend.

In the South Fork of Sage Creek near Freedom Pass a new center of Black Hills beetle activity has developed. Ground evaluations in the area show approximately 500 lodgepole pine trees currently infested on approximately 500 acres. Brood densities were high averaging 234.4 per square foot. Average DBH of infested trees was 14.8 inches. Buildup ratio appeared to be around 3:1. This infestation could become serious because of the proximity of a large stand of mature lodgepole pine to the north.

Other areas of known Black Hills beetle activity but not evaluated this year are listed as follows:

AREAS	APPROXIMATE NUMBER OF CURRENTLY INFESTED TREES
Morgan Meadows	50-75 (Infested trees occur in scattered groups of 10-15 trees per group.)
Dela Basin	150-200 (In widely scattered small groups.)
Big Canyon - Red Pine Spring	50-75 (Area examined, but no brood samples taken. May be dropping off.)
Rattlesnake Canyon	25-50
Tincup Creek	150-200 (Infested trees occur in scattered groups of 5-10-25 trees per group and extend from Houtz Creek east to the forest boundary.)
McCoy Creek	200± (Infested trees occur in groups of 5-15-30 trees per group and extend from McCoy Creek near Palisades Reservoir south to Trout Creek.
Jackknife Creek	400± (Infested trees occur in scattered groups of 10-25-100 trees per group and extend south and east along the main drainage to the forest boundary.)
Gravel Creek	50-100 (In widely scattered small groups.)
Bridge Creek	100-150 (In widely scattered groups.)
Fischer Hollow	25-50
Little Beaver Creek	50-100 (May be an extension of the Crow Creek infestation.)
Hawks Roost	50-75

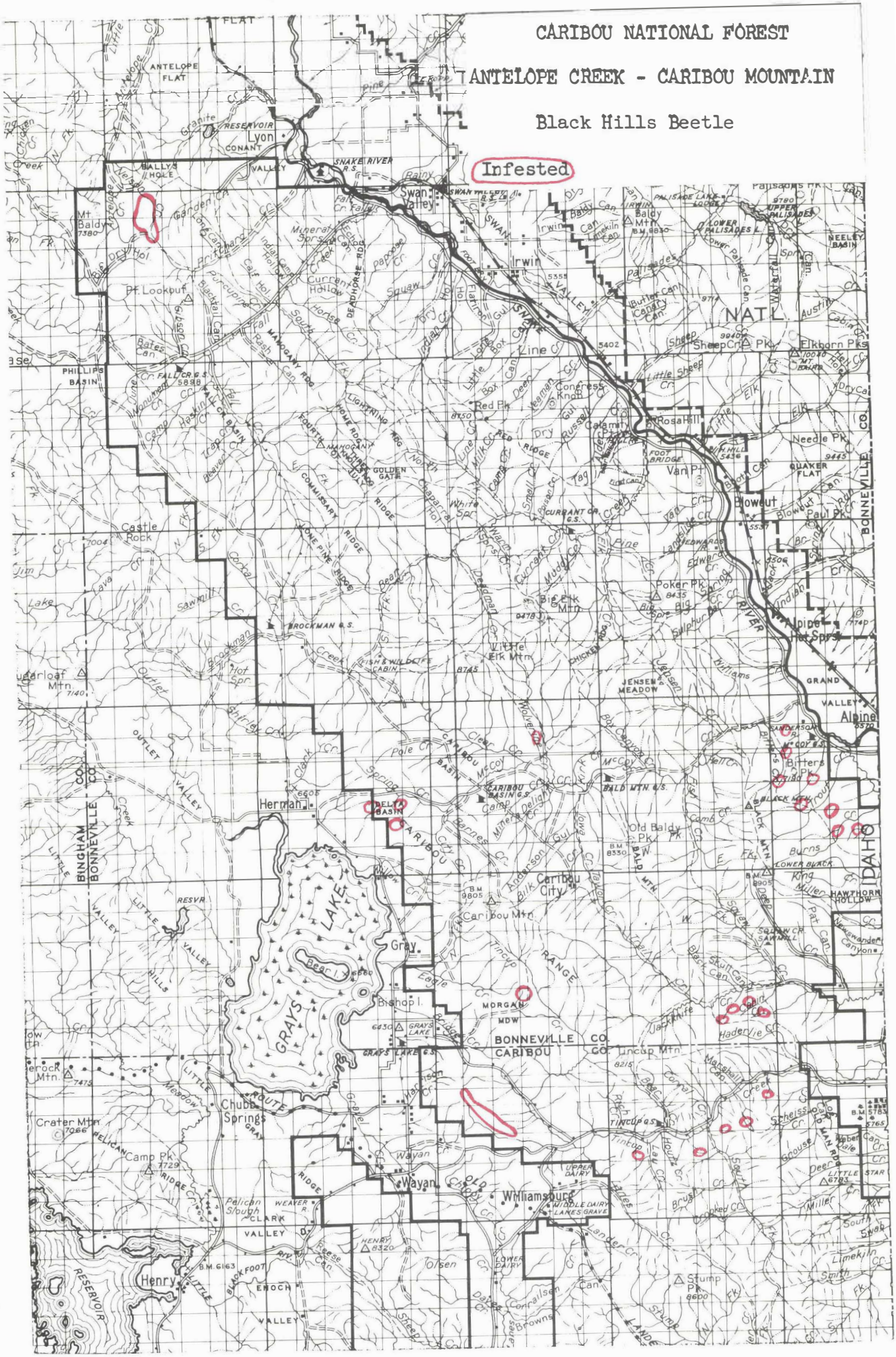
At present most of the Black Hills beetle infestation centers on the Caribou National Forest appear to be building up rapidly and the increase will probably continue. In all areas examined, broods appear to be healthy with very few predators and parasites being observed. Buildup ratios average two new attacks for each tree killed last year. Most areas contain sufficient host material to sustain the epidemic populations

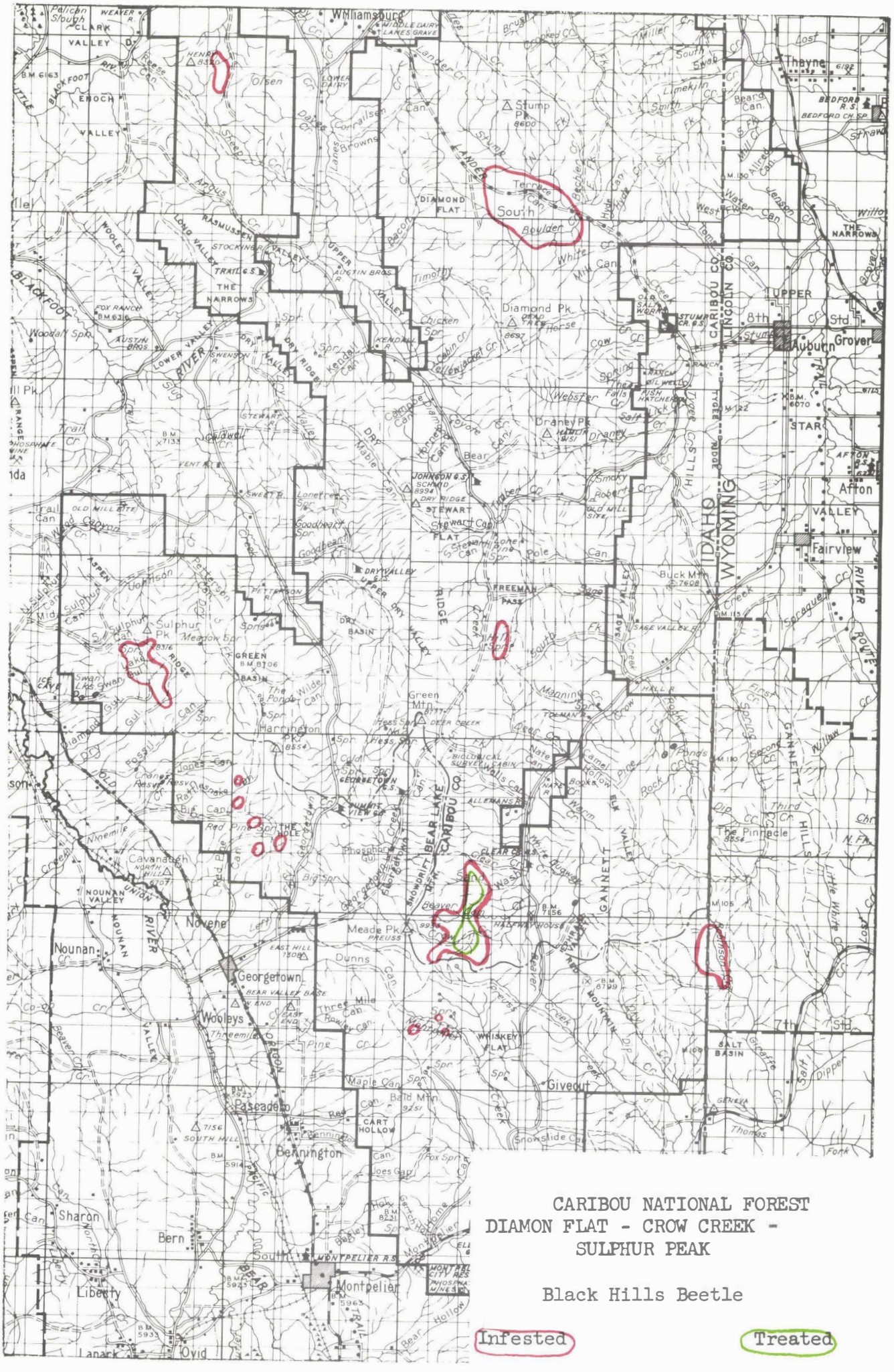
at least through next year. In nearly all the infestations the bark beetle population is epidemic, and unless materially reduced, by suppressive action or logging, will attack and kill an increased number of trees over a wide area next year.

CARIBOU NATIONAL FOREST

ANTELOPE CREEK - CARIBOU MOUNTAIN

Black Hills Beetle




CARIBOU NATIONAL FOREST
DIAMON FLAT - CROW CREEK -
SULPHUR PEAK
Black Hills Beetle
Infested
Treated

Sawtooth National Forest

Isolated infestations of the Black Hills beetle have been active on the Sawtooth National Forest for at least the last 15 years. A few infestations in high value areas have been successfully reduced by chemical treatment. Others have died out on their own. Presently, the Black Hills beetle is killing groups of lodgepole pine trees in five areas on the Cassia Division and scattered areas of the North Division.

On the Cassia Division aerial observers detected small groups of lodgepole pine killed by the Black Hills beetle in the head of Three Forks, Palmer, and Shoshone Creeks. At present the infestations are small but could build up and spread. In the vicinity of Pike Spring a limited amount of control work was done to reduce the beetle population in a small infestation discovered last year. Evaluations made in November of this year revealed the bark beetles had flown and had successfully attacked many trees that had already been treated. It is possible that latent action of the fumigant will kill the broods before next summer. In addition to the reattacks there are about 200 currently infested trees in the general vicinity of Pike Springs. If possible, these trees should be treated in 1965.

Logging operations were successful in reducing the number of lodgepole pine infested in the Wahlstrom Hollow infestation. Approximately 1,500 infested lodgepole pine were removed from the area by July of this year. This year only 14 newly attacked trees were found. These are scheduled to be removed by logging before beetle flight next summer.

A chronic infestation of Black Hills beetle has been present for several years along Warm Springs Creek on the northern division of the Sawtooth National Forest. Aerial observers indicate that Black Hills beetle infestations in Cabin Gulch, South Fork of Warm Springs Creek, Meadow Creek, and the Middle Fork of Warm Springs Creek have not increased since last year.

On the north side of Warm Springs Creek there are two groups containing from 100 to 150 faded trees each as well as a scattering of groups containing 20 to 50 trees each. A majority of the groups occur in or near the side drainage of Placer and Castle Creeks.

At the present time most of the Black Hills beetle outbreaks on the Sawtooth National Forest are static or near static in nature.

Nov 1964

Targhee National Forest

Active infestations of Black Hills beetle in lodgepole pine on the Targhee National Forest, eastern Idaho, have been chemically treated periodically since 1928. In 1928 approximately 12,000 trees were reported to be infested near Spencer, Idaho. Over 146,000 trees were treated in the Teton Basin area during the 1947-1950 Targhee-Teton control project. During 1964, 59,988 infested trees were chemically treated on 40,339 acres.

Last year (1963) fall biological evaluations showed epidemic brood densities, averaging over 230.0 per square foot and an explosive build-up was expected in 1964.

Evaluations conducted this spring showed that no signficant brood mortality through the winter had occurred in any of the areas examined. Spring brood densities averaged 187.5 per square foot of bark surface.

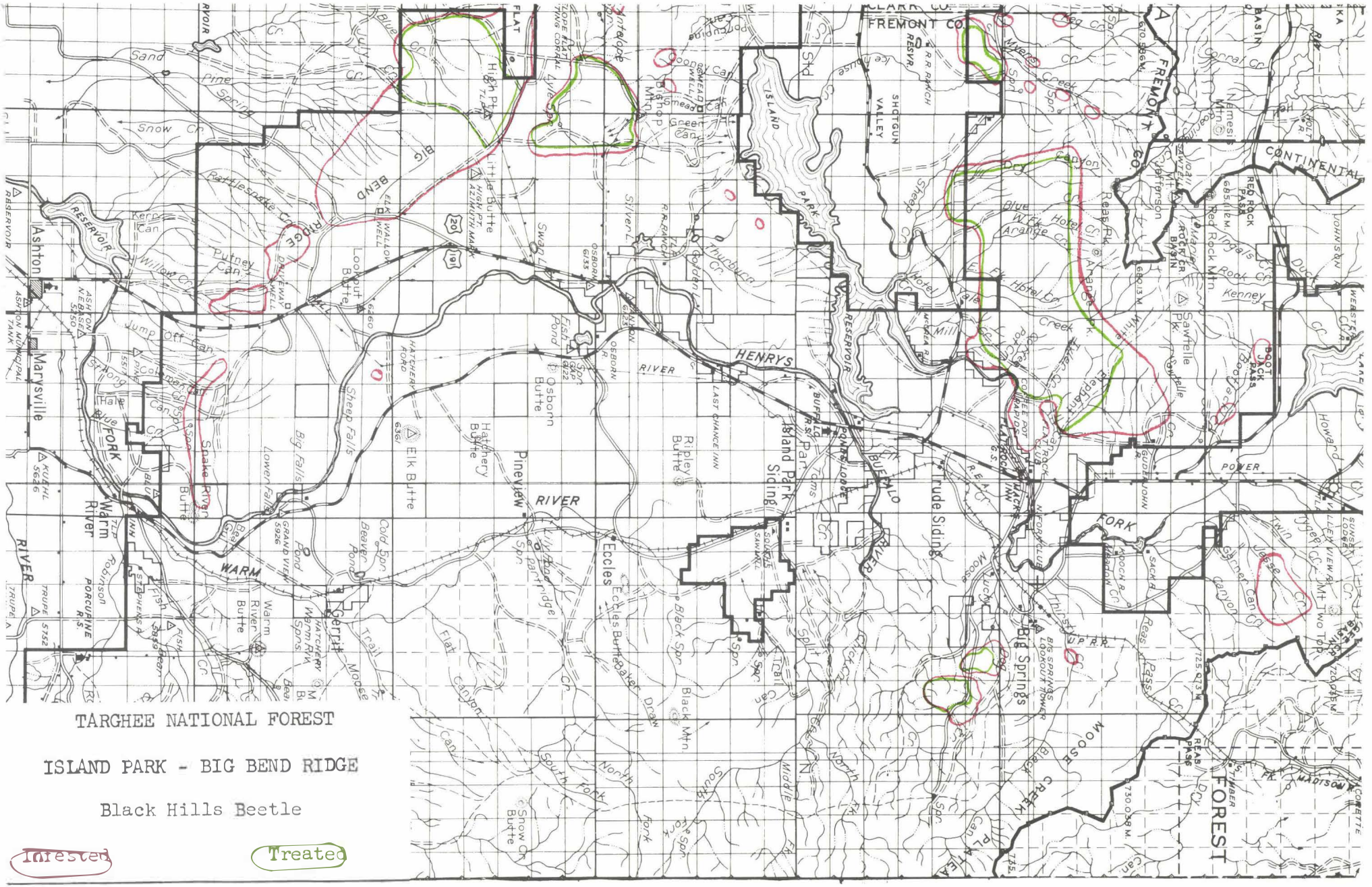
An unusually wet spring detained the treating crews from getting into the infested areas; consequently, about three weeks treating time was lost and a considerable number of infested trees were left untreated.

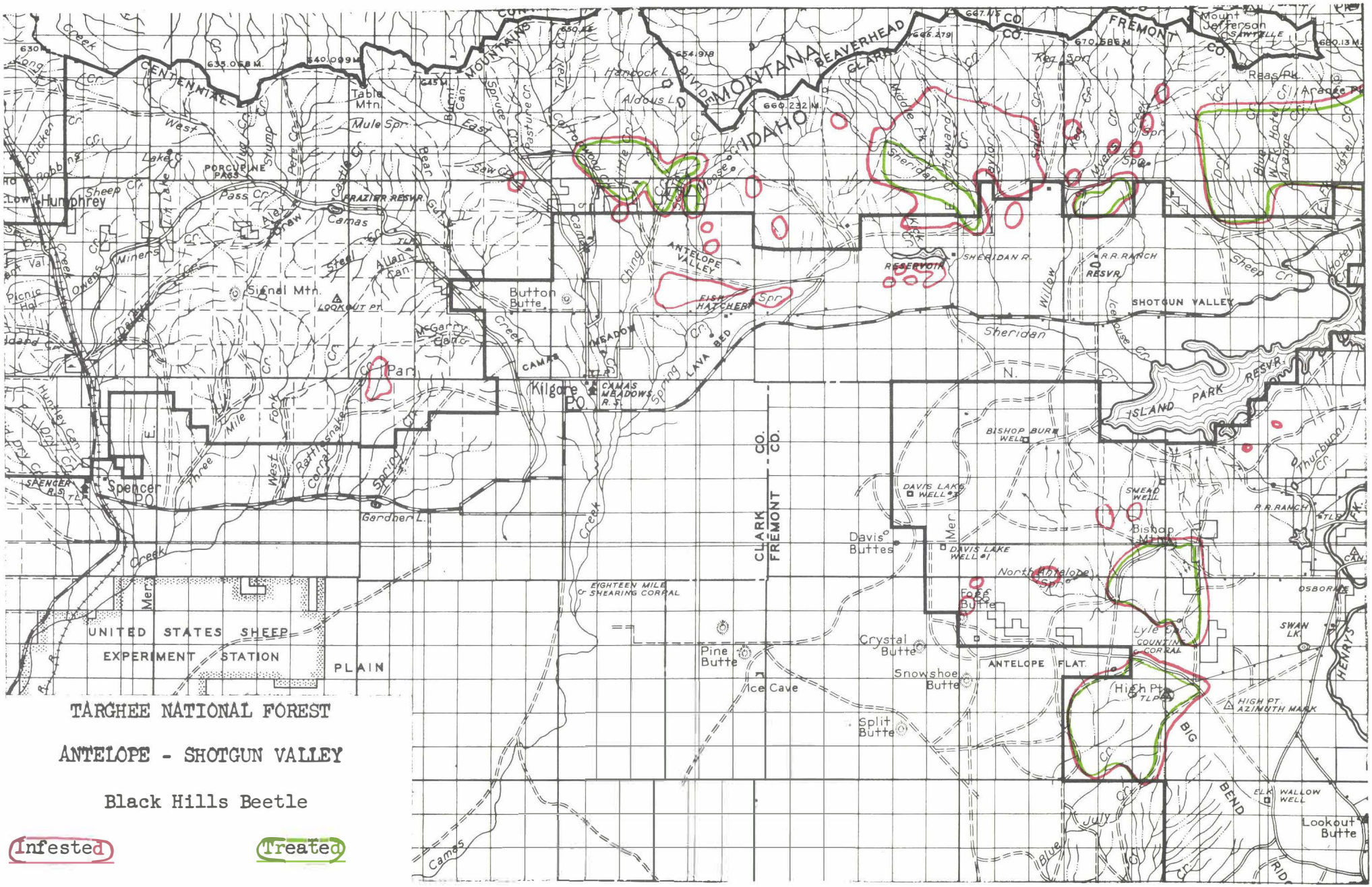
Surveys conducted by Targhee National Forest personnel show that over one million lodgepole pine are currently infested on approximately 150,000 acres. Aerial detection surveys this fall show considerable spread in old infestation centers. Very few new centers of activity were observed.

This fall, brood densities averaged 201.8. However, egg laying in some areas was not complete at the time samples were taken; consequently, brood densities will probably exceed those recorded. Insect predators and parasite populations were light in all areas examined. Attack densities equaled or exceeded those recorded in 1963.

These factors, plus large buildup ratios, abundance of suitable host material and the explosive potential of the beetle explain the rapid increase of infested lodgepole pine on the Targhee National Forest.

Black Hills beetle activity is expected to continue at an epidemic level with an increasing trend for at least one more year on the Targhee National Forest.


FREMONT CO.
CLARK CO.
Ashton
Marysville
Warm River
Island Park
Island Park Siding
Trude Siding
Big Springs
Eccles
Henrys
Pineview
Gerrit
Osborn Butte
Elk Butte
Hatchery Butte
Ripley Butte
Lookout Butte
Little Butte
Big Bend
Rattlesnake Cr.
Snake River
Pine Creek
Sand Creek
Snow Cr.
Willow Cr.
Putney Can.
Jump Off Can.
Kerr Can.
Sheep Falls
Big Falls
Lower Falls
Warm River
Pineview River
Henrys River
Buffalo River
Moose Creek
Island Park Reservoir
Ashton Reservoir
Big Bend Ridge
Sawtelle Pk.
Red Rock Mtn.
Bishop Mtn.
Black Mtn.
Snow Ck. Butte
Sawtelle Mtn.
Mt. Two Top
Mt. Jefferson
Kenney
Howard
Duck
Johnson
Continental
Big Springs Lookout Tower
Big Springs Ranger Station
Buffalo River Ranger Station
Warm River Ranger Station
Ashton Municipal Tank
Kushel 5626
Trupe 5752
Grand View 5926
Sawtelle 6850
Osborn 6133
Henrys 6123
Lookout Butte 6260
Elk Butte 6361
Sawtelle Pk. 6860
Red Rock Mtn. 6851
Bishop Mtn. 6804
Mt. Two Top 7125
Mt. Jefferson 6804
Island Park Lodge
Buffalo River Lodge
Pond's Lodge
Last Chance Inn
Hatchery Road
Trail Creek
Moose Creek
Flat Canyon
Split Canyon
Partridge Draw
Black Mtn. Draw
Cold Spr.
Beaver Pond
Fish Pond
Lookout Spr.
Partridge Spr.
Black Spr.
Split Spr.
Sawmill Spr.
Hatchery Warm River Spr.
Big Bend Spr.
Fish Spr.
Bear Spr.
Elk Wallow Well
Bellevue Well
Ashton Municipal Well
Ashton Municipal Tank
Island Park Reservoir
Ashton Reservoir
Big Springs Lookout Tower
Big Springs Ranger Station
Buffalo River Ranger Station
Warm River Ranger Station


TARGHEE NATIONAL FOREST
ANTELOPE - SHOTGUN VALLEY
Black Hills Beetle
Infested
Treated
MONTANA
IDAHO
CENTENNIAL
REAVERHEAD
CLARK
FREMONT
CLARK CO.
FREMONT CO.
DIVIDE
Table Mtn.
Mule Spr.
PORCUPINE PASS
Pass Cr.
Humphrey
Lake Cr.
Camas
BRAZIER RESVR.
Signal Mtn.
LOOKOUT PT.
Button Butte
Kilgore P.O.
CAMAS MEADOWS R.S.
Spencer P.O.
SPENCER R.S.
Gardner L.
UNITED STATES SHEEP EXPERIMENT STATION
PLAIN
EIGHTEEN MILE CR. SHEARING CORRAL
ANTELOPE VALLEY
FISH HATCHERY
SHERIDAN RESERVOIR
SHERIDAN R.
R.R. RANCH RESVR.
SHOTGUN VALLEY
ISLAND PARK RESVR.
BISHOP BURN WELL
DAVIS LAKE WELL #3
DAVIS LAKE WELL #1
SWEAD WELL
Davis Buttes
Bishop Mt.
North Antelope Spr.
Foree Butte
Crystal Butte
Pine Butte
Ice Cave
Snowshoe Butte
Split Butte
ANTELOPE FLAT
High Pt.
HIGH PT. AZIMUTH MARK
Lyle Spr. COUNTING CORRAL
SWAN LK.
HENRYS
BIG BEND
ELK WALLOW WELL
Lookout Butte
Mount Jefferson
Reas Pk.
Hancock L.
Aldous L.
Middle Fk.
Sheridan
Willow
Icehouse Cr.
Sheep Cr.
Blue Nose Spr.
Hotel
Chicken Cr.
Long Cr.
Sheep Cr.
Steel Cr.
Allan Can.
Ching Cr.
McGarry Cond.
Camas Creek
Spring Lava Bed
Meadow Cr.
Picnic Ha
Huntley Can.
E. Fork Three Mile Cr.
West Fork Rattlesnake Cr.
Spring Cr.
Gardner Creek
Cottonwood Cr.
Bear Can.
Sawtooth Cr.
Pleasure Cr.
Stump Cr.
Alex Draw
Miners Cr.
Onest Cr.
Val Cr.
Hobbs Cr.
Middle Fk. Spr.
Sheridan Cr.
Taylor Cr.
Spring Cr.
Blue Nose Cr.
Thurbuan Cr.
Osborne
Cr.
Creek
Fk.
Spr.
Mer.
R.S.
T.L.P.
Can.

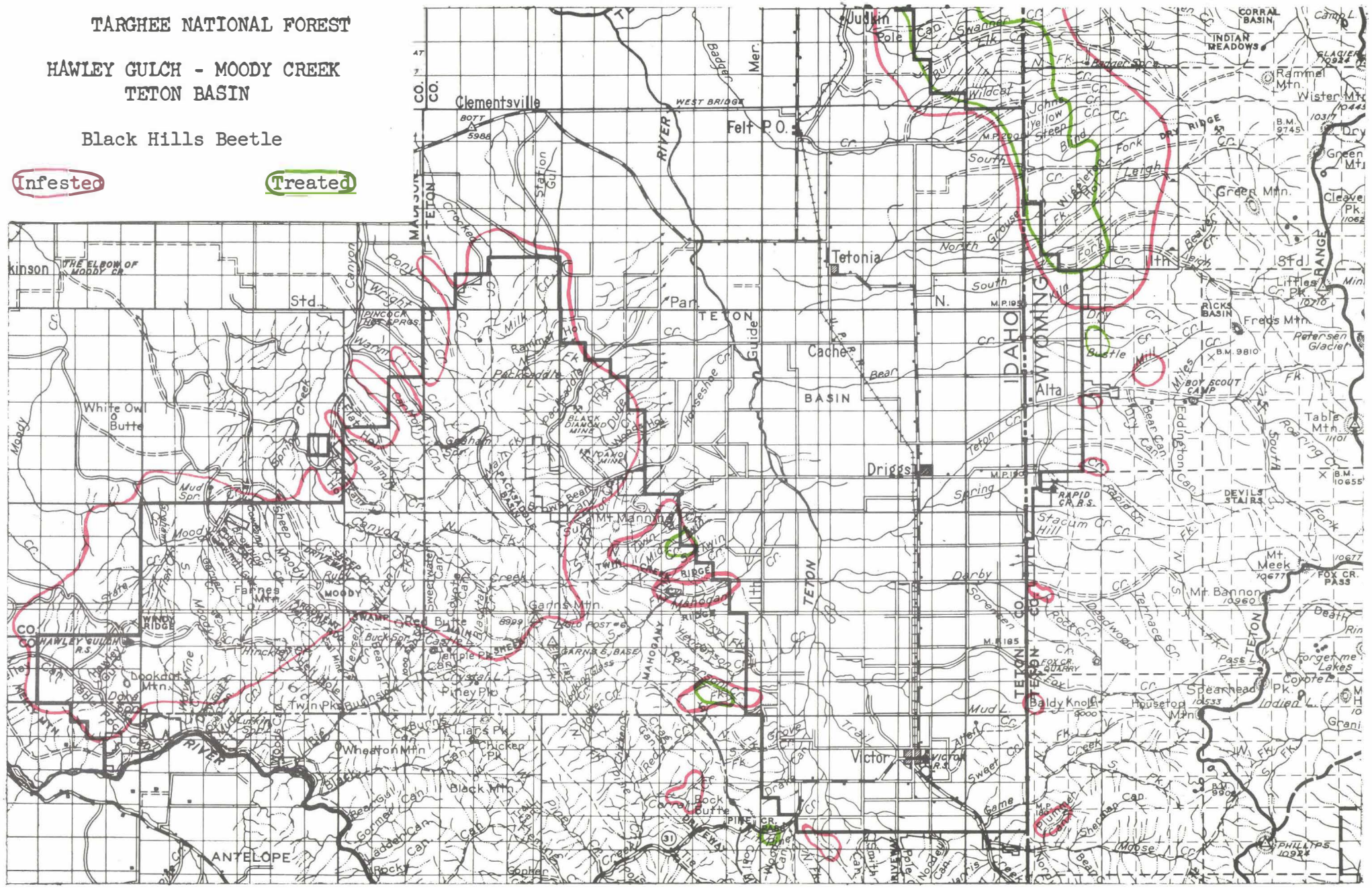
TARGHEE NATIONAL FOREST

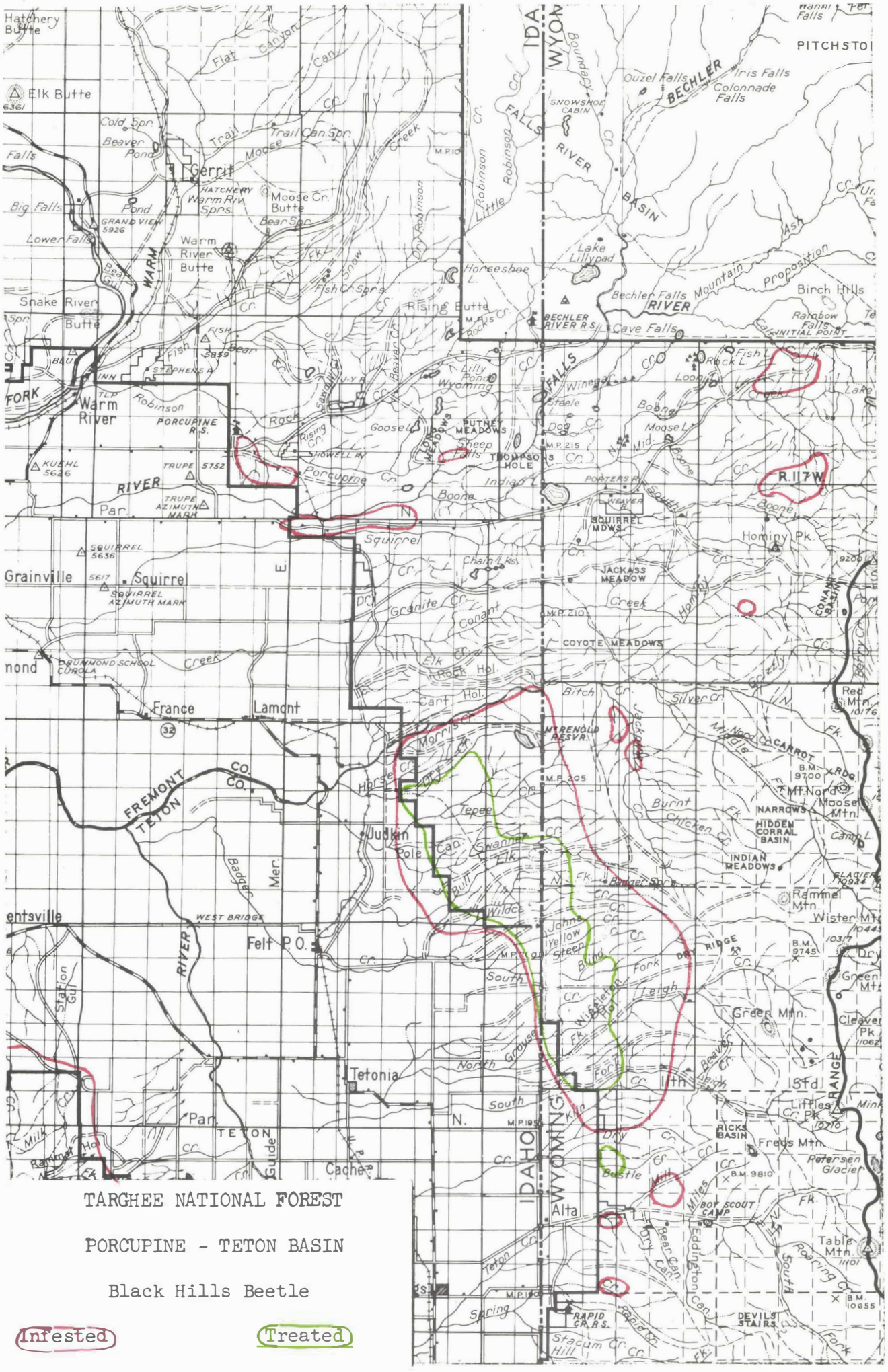
HAWLEY GULCH - MOODY CREEK
TETON BASIN

Black Hills Beetle

Infested

Treated




Hatchery Butte
Elk Butte
Gerrit
Warm River Butte
Moose Cr. Butte
Rising Butte
Snake River Butte
Warm River
Grainville
Squirrel
France
Lamont
Judkin
Felt P.O.
Tetonia
Alta
Bechler Falls
Cave Falls
Lake Lillypad
Horseshoe L.
Putney Meadows
Jackass Meadow
Coyote Meadows
Indian Meadows
Hidden Corral Basin
Narrows
Mt. Nord
Moose Mtn.
Rammel Mtn.
Wister Mtn.
Green Mtn.
Freds Mtn.
Table Mtn.
Hominy Pk.
Birch Hills
Mt. Reynolds Reservoir
Rapid Cr. R.S.
Devils Stairs
Ricks Basin
Boy Scout Camp
R.11 7W
IDAHO
WYOMING
FREMONT CO.
TETON CO.
TARGHEE NATIONAL FOREST
PORCUPINE - TETON BASIN
Black Hills Beetle
Infested
Treated

Teton National Forest

Epidemics of the Black Hills beetle were recorded in lodgepole pine stands on and adjacent to the Teton National Forest as early as 1914. Large volumes of timber have been killed yearly during the present outbreak which started in 1956. Logging and chemical control have reduced the number of infested trees in some control units but in most areas the number of infested trees has increased at an alarming rate since last year. During 1963 operational surveys estimated 180,300 trees were infested; of these, 156,000 were treated in 1964. Operational surveys this fall estimate 425,000 trees are currently infested. Aerial surveys indicate a considerable spread of old infestation boundaries as well as several new epidemic centers. In addition, aerial observers indicate a tremendous increase of newly faded trees in the Wilderness Area and along the southern boundary of Yellowstone National Park. In all probability, as many trees are infested in the Wilderness Area as are currently infested within the areas surveyed.

Infestations on the Teton National Forest are discussed in two parts--North Teton and South Teton.

North Teton

All the Teton National Forest north of Jackson, Wyoming, is considered as North Teton in this report. Fall 1964 operational surveys show 399,000 trees are infested within the areas surveyed.

In July 1963 brood densities averaged 114.4 per square foot sample, showing over one-half the brood survived through to the adult stage in spite of 98 percent mortality during the previous winter in localized areas.

Surviving brood was sufficient to maintain the epidemic trend and cause an increase in number of infested trees. Fall 1963 brood densities and attacks per square foot of bark sample averaged 314.6 and 9.8, respectively. Brood mortality through the winter (1963-1964) was extremely low in all areas examined. Samples taken on the Teton National Forest in May and July of 1964 showed an average brood density of 239.8 with only one area showing brood density below 218 per square foot. Thus, over twice as much brood survived last winter as did in 1962-1963. This brood density is far above the level sufficient to maintain the present epidemic trend.

The following table shows fall biological data and estimated number of currently infested trees on the North Teton:

Location	Average DBH	Ave. Brood Density Per Square Foot	Attacks Per Square Foot	Trend
Blackrock-Hatchet	14.4	105.6	8.0	E. I. 79,600
Ditch Creek	16.4	130.8	8.0	E. I. 30,000
Lava Creek	14.0	221.2	8.8	E. I. 62,200
Lost Creek	11.6	109.6	9.6	E. I. No est.
Pacific Creek	11.2	140.0	6.8	E. I. 61,200
Rosies Ridge	16.8	150.0	11.8	E. I. 60,000
Spread Creek		No Fall Data		37,200
Antelope Mt.		No Fall Data		10,900
Pilgrim Mt.		No Fall Data		61,200

E = Epidemic
I = Increasing

Brood densities collected this fall on the North Teton averaged 142.8 per square foot of bark sample. A brood density of this nature might be attributed to the extended attack period of the Black Hills beetle this year. When fall evaluations were made, some beetles had just infested trees and gallery construction was incomplete. Beetles which had successfully attacked trees were still depositing eggs. Gallery extension and egg deposition will probably continue through next spring. Although brood densities were low at the time of sampling, we believe they will exceed that required to indicate explosive tendencies, when egg deposition is completed.

In a small infestation in the Cache Creek Drainage east of Jackson, Wyoming, operational surveys estimate 260 newly infested trees. This infestation has persisted for three or four years and is not indicative of the explosive development experienced in other Teton infestations. The ratio of newly attacked trees to trees killed last year was 1:1. This infestation might increase in seriousness and develop an explosive pattern. No biological evaluations were made of this infestation in 1964, but it will be evaluated early next year to determine if treatment will be necessary to prevent a widespread outbreak.

The Black Hills beetle infestations on the North Teton pose a serious threat to adjacent lodgepole pine stands outside the infested area as well as to uninfested trees within areas already infested.

Unless control action is initiated in all infested areas, it is possible that twice to three times as many lodgepole pine will be attacked and killed next year.

South Teton

In the Hoback Drainage operational surveys in areas previously treated estimate 26,330 lodgepole pine are infested with Black Hills beetle on about 5,720 acres. This is approximately 4,000 more than were infested last year. It is estimated there are over 65,000 newly infested trees in all the Hoback Drainage. In general there does not appear to be the

explosive type development on the South Teton which is indicative of the North Teton. No control work has been done since 1962 in the Hoback Drainage and no control is planned for 1965.

Aerial observers estimate approximately 5,000 lodgepole pine "faders" at the head of the Hoback Drainage along Highway 189. Groups of infested trees are larger and contain more "faders" per groups than occurred last year in this area. Brood densitites average 224.0 per bark sample. The ratio of newly attacked trees to trees killed last year is 2:1. Approximately one pitched-out tree was found for every eight successfully attacked trees. This infestation is part of the Kismet Peak infestation which occurs on Bureau of Land Management, state and private lands. On lands of all ownership there are an estimated 25,000-30,000 infested trees. Based on the present information, the trend is increasing and the infestation has the potential to spread onto the Bridger National Forest as well as the Teton National Forest.

Large groups of currently faded trees were detected by aerial observers throughout the Sandrock, Sour Moose, and North Fork of Fisherman's Creek Drainages. Operational surveys estimate 13,700 trees are currently infested in the North Fork of Fisherman's Creek. Infested trees average 18.0 inches in diameter. The ratio of newly attacked trees to trees killed last year is about 3:1. Brood densities average 209.6 per bark sample. There are no signs of a reversal of the present epidemic trend within the next year.

Operational surveys estimate 2,400 infested trees on 630 acres in Jack Creek. Most of the mature and overmature timber has been killed where the infestation first started in Jack Creek. A majority of the infested trees now occur near Raspberry Ridge and up the main Jack Creek Drainage. Infested trees average 16.0 inches DBH. Brood and attack densities average 238.0 and 12.8 per square foot of bark sample, respectively. This is above the level sufficient to maintain the present epidemic trend and unless treated it could spread into the adjoining Bridger National Forest.

Epidemic conditions persist in Dell Creek. Attacked trees average 14.0 inches in diameter. Operational surveys indicate approximately 7,230 newly attacked trees on about 2,410 acres. Brood densities average 189.6 per square foot of bark indicating the outbreak will probably continue at its present level for another year.

According to the operational survey, there are 2,680 lodgepole pine currently infested in Shoal Creek. This indicates a buildup ratio of approximately 1:1.

Attacked trees average 16.4 inches in DBH. Brood densities and attack averaged 158.4 and 10.8 per square foot of bark sampled, respectively. At the time of sampling, 80 percent of the beetles had just attacked trees and were depositing eggs. It appears tha brood densities will average over 200 per square foot when egg deposition is complete. The

infestation is classed as epidemic with no indication of a downward trend in the near future.

The number of infested lodgepole pine in the Granite Creek Drainage has increased greatly over last year. "Faders" occur in groups of 50-75 trees per group throughout Granite Creek. Entomologists estimate about 6,000 newly attacked lodgepole pine in this area. Brood densities and attacks per square foot of bark sample average 319.6 and 12.6, respectively. Average size of infested trees is 16.0 inches DBH. The brood density is far above the level we believe sufficient to maintain the epidemic trend. Without treatment the number of infested trees will undoubtedly increase next year.

In addition, aerial observers this year located current Black Hills beetle activity in the following areas:

AREA	NUMBER OF TREES
Coyote Gulch	500
South of Hoback Guard Station	400
Little Cliff Creek	150
Willow Creek	1,500

No biological evaluation has been made of these areas.

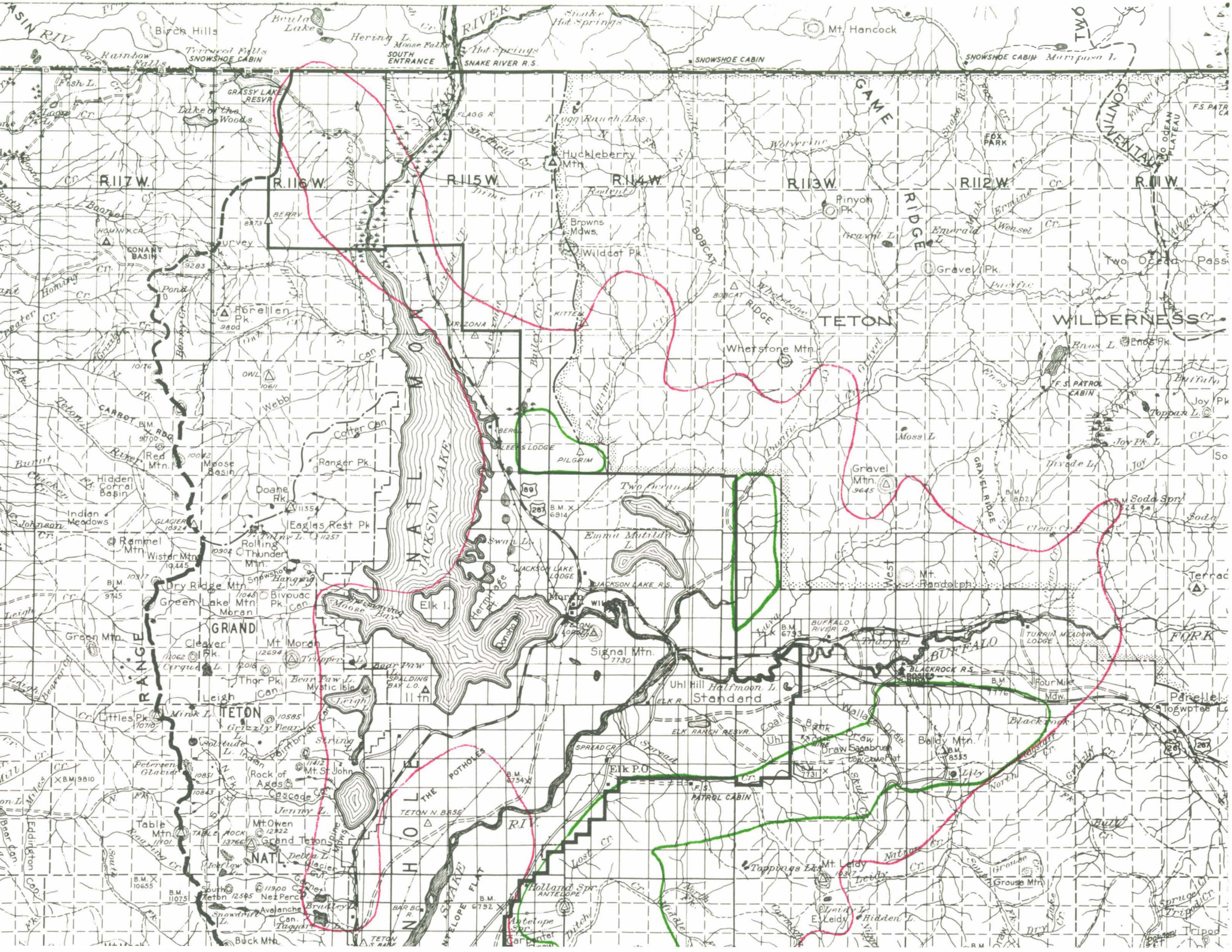
Grand Teton National Park

The current Black Hills beetle infestation in lodgepole pine forest of Grand Teton National Park has persisted at epidemic levels since 1955. A chemical control program to minimize the loss of lodgepole pine caused by this beetle was initiated in 1957 and continued through 1961. Lack of funds prevented any major control action in 1962; consequently, a large increase in the number of infested trees occurred. The 1962 fall operational survey showed over 44,000 trees infested; only 2,000 were chemically treated. Brood mortality through the winter of 1962-1963 exceeded 98 percent in localized areas along the northern end of the park. This mortality was too localized and not severe enough to change the epidemic trend. In 1963, 30,000 infested trees were treated. About 15,000 trees were left untreated due to lack of funds. Operational surveys the fall of 1963 showed over 70,000 trees infested, a buildup ratio of 4:1. All areas surveyed in 1963 were chemically treated in 1964.

Brood densities sampled during the fall of 1963 averaged 269.7 per square foot of infested bark. Biological evaluations this spring indicated brood mortality through winter was very low. The number of attacks per square foot increased over the last three years from 7.9 to 9.1 to 10.0 in 1964. Brood densities this fall average 254.6 per square foot of bark sample. At the time biological evaluations were made this fall, attacks, galleries, and egg laying were not complete; consequently, the brood density will undoubtedly be higher than recorded.

Approximately 78,000 trees were chemically treated in Grand Teton National Park this year. Operational surveys this fall indicate over 90,000 newly infested trees.

There are no factors which indicate the trend of the Black Hills beetle will start downward in the near future. Unless chemical control is continued it is likely there will be an increased number of infested trees in Grand Teton National Park next year.


Birch Hills
Rainbow Falls
Terrace Falls SNOWSHOE CABIN
SOUTH ENTRANCE
SNAKE RIVER R.S.
Mt. Hancock
SNOWSHOE CABIN
SNOWSHOE CABIN
GRASSY LAKE RESVR
Lake of the Woods
R.117W.
R.116W.
R.115W.
R.114W.
R.113W.
R.112W.
R.111W.
Huckleberry Mtn.
Pinyon Pk.
Browns Mows.
Wildcat Pk.
BOBCAT RIDGE
GAME
CONTINENTAL DIVIDE
TWO OCEAN PLATEAU
FOX PARK
Gravel Pk.
Two Ocean Pass
TETON WILDERNESS
Whetstone Mtn.
Ridge Pk.
F.S. PATROL CABIN
CONANT BASIN
Horellen Pk.
9800
Pond
BERRY
ARIZONA
KITTEN
PILGRIM
CLEEK'S LODGE
OWL
CARBOT RIDGE
Red Mtn.
Moose Basin
Ranger Pk.
Doane Pk.
Eagles Rest Pk
Hidden Corral Basin
Indian Meadows
Rammel Mtn.
Wister Mtn.
Rolling Thunder Mtn.
Dry Ridge Mtn.
Green Lake Mtn.
Moran
Bivouac Pk.
Gravel Mtn.
9645
Soda Spr.
Swan L.
Emma Matilda L.
Two Ocean L.
Moss L.
Joy Pk.
Joy Pk. L.
Divide L.
Toppan L.
Terrace
JACKSON LAKE
JACKSON LAKE LODGE
JACKSON LAKE R.S.
Elk I.
Moose
Signal Mtn.
7730
Mt. Randolph
West
GRAND TETON NATL. PARK
RANGE
Green Mtn.
Cleaver Pk.
Mt. Moran
12694
Triangle
Thor Pk.
Bear Paw L.
Mystic Isle
SPALDING BAY LO.
Leigh L.
Leigh Can.
Minor L.
Littles Pk.
10710
10585
Grizzly Bear L.
Solitude L.
Indian
Petersen Glacier
Rock of Ages
Cascade Can.
Mt. St. John
Jeremy L.
Table Mtn.
TABLE ROCK
Mt. Owen
12922
Grand Teton
13766
Teton Glacier
Delta L.
Avalanche Can.
South Teton
12595
Buck Mtn.
Snowdrift L.
Brittle Pk.
Taggart L.
Eddington Col.
Bear Can.
Mitchell Cr.
Spread Cr.
Elk P.O.
F.S. PATROL CABIN
Uhl Hill
Halfmoon L.
Standard
ELK R.
ELK RANCH RESVR.
Coal Bank Draw
Sagebrush Draw
Wallace Draw
Bobby Mtn.
8535
Lily L.
Blackrock
Four Mile Mdw.
Parcelle
Togwotee
BUFFALO FORK
BUFFALO RIVER R.
BLACKROCK R.S.
TURRIN MEADOW LODGE
Tappings L.
Mt. Leidy
10237
Leidy
Grouse Mtn.
E. Leidy L.
Hidden L.
Tripod Cr.
Tripod
Pothole
Holland Spr.
ANTELOPE
Antelope Spr.
Carpenter
SNAKE RIV.
SNAKE RIVER
ANTELOPE FLAT
TETON N. BASE
BAR BC R.
Lost Cr.
Nitchie Cr.
Marble Cr.
Granite Cr.
Buffalo
Sheep Mtn.
Terrace
Soda
Joy
Burnt
Webb
Cotter Can
Johnson Cr.
Leigh
Bearpaw
Moose
Homing
Granite
Berry Cr.
Grizzly
Gravel
Pilgrim
Buffalo
Spread
Wolverine
Flagg Ranch Lks.
Flagg R.
Sheffield Cr.
Buffalo
Snake
Hot Springs
Moose Falls
Hot Springs
Heron L.
Beula Lake
Fish L.
Lodge Cr.
Moose
Emerald
Wensel
Ermine
Two Ocean
Pacific
Brant L.
Trapper
Swan
Heron
Moose
Bivouac
Can.
Moose
Moran
Bay
Spalding
Bay
Leigh
Bearpaw
Mystic
Minor
Littles
Grizzly
Solitude
Indian
Petersen
Glacier
Jeremy
Table
Mt. Owen
Grand Teton
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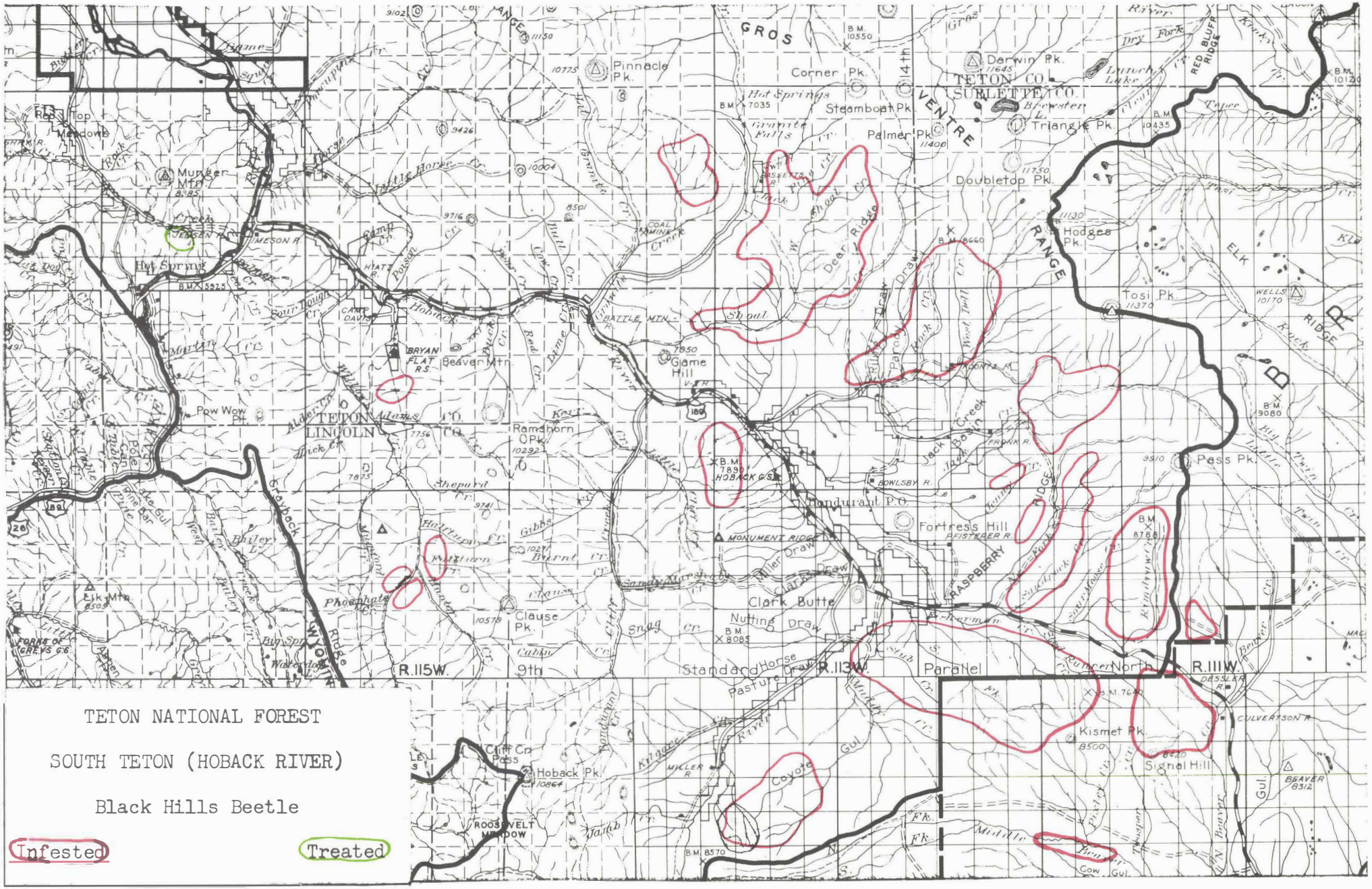
Moose
Bivouac


TETON NATIONAL FOREST
SOUTH TETON (HOBACK RIVER)
Black Hills Beetle
Infested
Treated
R.115W.
R.113W.
R.111W.
9th
14th
Pinnacle Pk.
Corner Pk.
Steamboat Pk.
Palmer Pk.
Darwin Pk.
Triangle Pk.
Doubletop Pk.
Hodges Pk.
Tosi Pk.
Pass Pk.
Kismet Pk.
Signal Hill
Munger Mtn.
Hot Springs
Beaver Mtn.
Game Hill
Ramshorn Pk.
Fortress Hill
Clark Butte
Nutting Draw
Clause Pk.
Elk Mtn.
Hoback Pk.
Cliff Cr. Pass
Standard Horse Pasture
Parallel
Dear Ridge
Jack Creek Basin
Monument Ridge
Raspberry Ridge
Red Bluff Ridge
Elk Ridge
Range
Teton Co.
Sublette Co.
Lincoln Co.
Sweetwater Co.
Hoback R.
Bryan Flat R.S.
Hoback G.S.
Roosevelt Meadow
Pow Wow Pk.
Top Meadows
Hot Spring
Jensen R.
Camp Davis
Four Bough Cr.
Phosphate Cr.
Snag Cr.
Coyote Gul.
Beaver 8312

Uinta National Forest

A Black Hills beetle infestation in lodgepole pine in the Current Creek Drainage south of Heber City, Utah, has been active for the past several years. Two years ago an explosive buildup took place. In 1963 approximately 1,500 lodgepole were infested.

Fall examinations this year indicate the infestation has taken a sharp downward trend. A reconnaissance through the infested area found only three newly attacked trees. The beetles have killed 80-90 percent of the lodgepole pine above 6 inches DBH and only a few possible host trees remain scattered throughout the infested area. Sixty-five to seventy percent of the stand within the infestation is other species, alpine fir, Douglas-fir, and aspen. The infestation now is endemic and no control action is needed.

Wasatch National Forest

An epidemic of Black Hills beetle has been active on the Wasatch National Forest for more than 14 years. In an extensive suppression effort, known as the North Slope Project, various kinds and degrees of control measures, such as chemical treatment, felling and burning, burning standing, and logging, have been used in an attempt to reduce the number of beetle-killed trees. Since the start of the Project in 1958, over 500,000 infested trees have been treated. Last year (1963) was the first year all the infested acreage was treated. This spring it was only necessary to treat 12,561 infested trees.

Treating and logging the past few years have removed infested trees as follows: 1963 - 81,000 trees; 1962 - 165,000 trees; 1961 - 167,000 trees; 1960 - 166,000 trees.

This sizeable reduction in the number of infested trees is largely due to control efforts. However, natural factors are now affecting the remaining bark beetle population. Whether the natural factors will exert a definite controlling influence cannot be determined at this time. A few pockets of infestation still exist.

Fall operational surveys estimate there are 2,740 newly attacked trees in the Utah section and 1,170 trees in the Wyoming section of the North Slope Project.

Even though this infestation is now at a low level, treatment should be done next year to eliminate the chance of the infestation rebuilding.

An additional 200 infested trees, widely scattered over 7,300 acres, are located in the Bear River area a considerable distance west of the main North Slope Project area.

A small, potentially serious, outbreak of Black Hills beetle was detected near the Wasatch-Ashley National Forest border in Deer Creek, a side drainage of the Duchesne River. Faded lodgepole pine occurred in five groups of approximately 100 trees per group. This infestation was not examined this year. No other serious outbreaks of Black Hills beetle were detected on the Wasatch National Forest this year.

Idaho - Bureau of Land Management, State, and Private Lands

Blackfoot Mountains

The isolated Black Hills beetle outbreak reported last year on Bureau of Land Management, State, and private lands in the Blackfoot Mountains southeast of Idaho Falls, Idaho, has continued to increased in size and severity. Ground observers estimate 10,000 - 15,000 lodgepole pine are infested on approximately 25,000 acres. Brood densities remained high averaging 184.6 per square foot. Average DBH of infested trees examined this fall was 19.8 inches. Buildup ratio was about 1:1. This infestation is epidemic and expected to continue with an increasing trend for at least one more year.

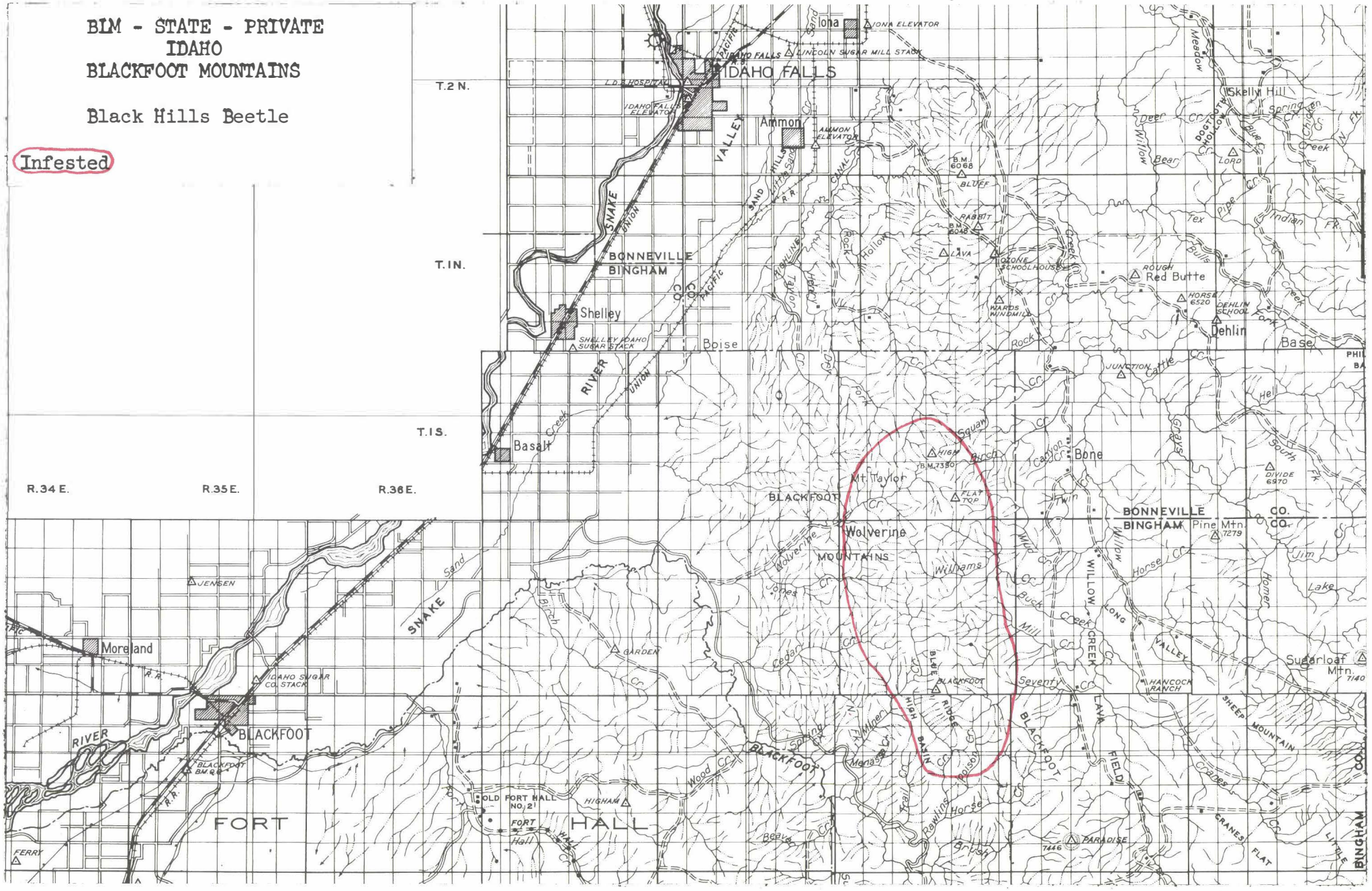
Lodgepole pine in this area makes up only about one-third of the stand, the remainder being alpine fir, Douglas-fir, Engelmann spruce, and aspen. Seventy percent of the lodgepole pine is in the overmature and mature age classes with thirty percent poles and reproduction.

Further losses can be expected in this area if no control measures are taken.

BLM - STATE - PRIVATE
IDAHO
BLACKFOOT MOUNTAINS

Black Hills Beetle

Infested



Utah - Uintah and Ouray Indian Reservation

A small infestation of the Black Hills beetle in ponderosa pine was evaluated at the request of the Bureau of Indian Affairs.

It was determined that approximately 70 overmature ponderosa pine have been killed by the Black Hills beetle over the past five years in the Hill Creek-Willow Creek Drainages on the Uintah and Ouray Indian Reservation and intermingled state lands. Infested trees have occurred as singles and in widely scattered groups of five to seven trees per group. Approximately 80 percent of the stand is mixed Douglas-fir, alpine fir, and Engelmann spruce. No newly infested trees were found adjacent to trees which adult beetles had emerged from this year. The infestation appears to be static with no indication of an increasing trend.

Wyoming - Bureau of Land Management, State, and Private Lands

Kismet Peak

The aggressive infestation of Black Hills beetles in lodgepole pine stands adjacent to the Teton National Forest in the upper Hoback River Drainage near Kismet Peak in western Wyoming continues at an epidemic level. A survey conducted by Bureau of Land Management personnel during late fall of 1963 showed approximately 25,000 trees were infested on these lands. Ground evaluations this fall (1964) showed a rough estimate of 30,000 - 40,000 lodgepole pine currently infested on 10,000 - 15,000 acres. Brood densities averaged 230.8 per square foot of bark sample. Buildup ratio of newly attacked trees to trees killed last year ranged from 2:1 to 3:1. Very few "pitchouts" were observed during ground evaluations. Average DBH of infested trees was 9.6 inches. All indications point to a continuing epidemic condition with no evidence of this infestation dying out by next year. To be effective any suppressive action contemplated for this infestation would need to be a cooperative endeavor involving all land owners.

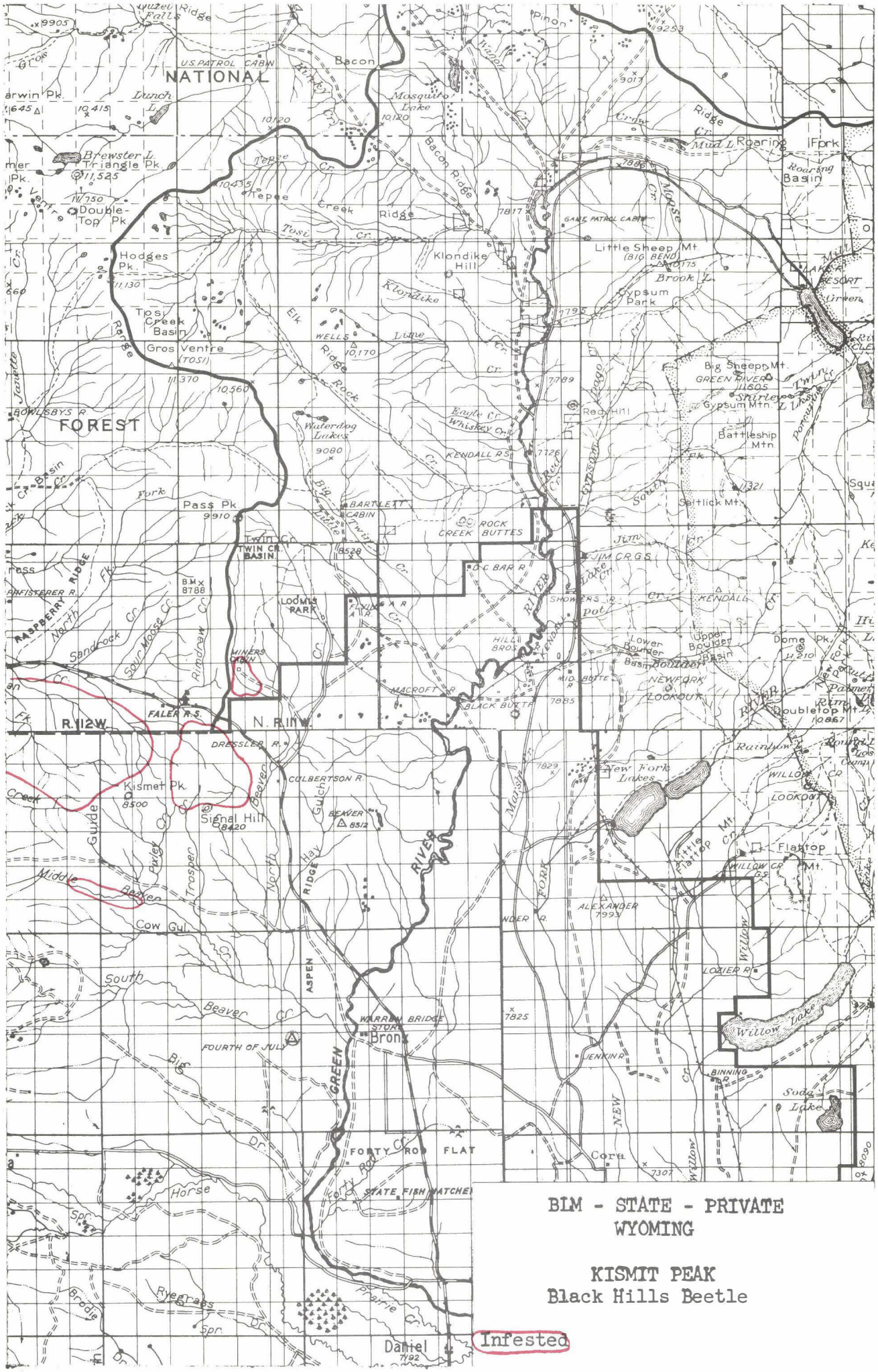
Little Mountain

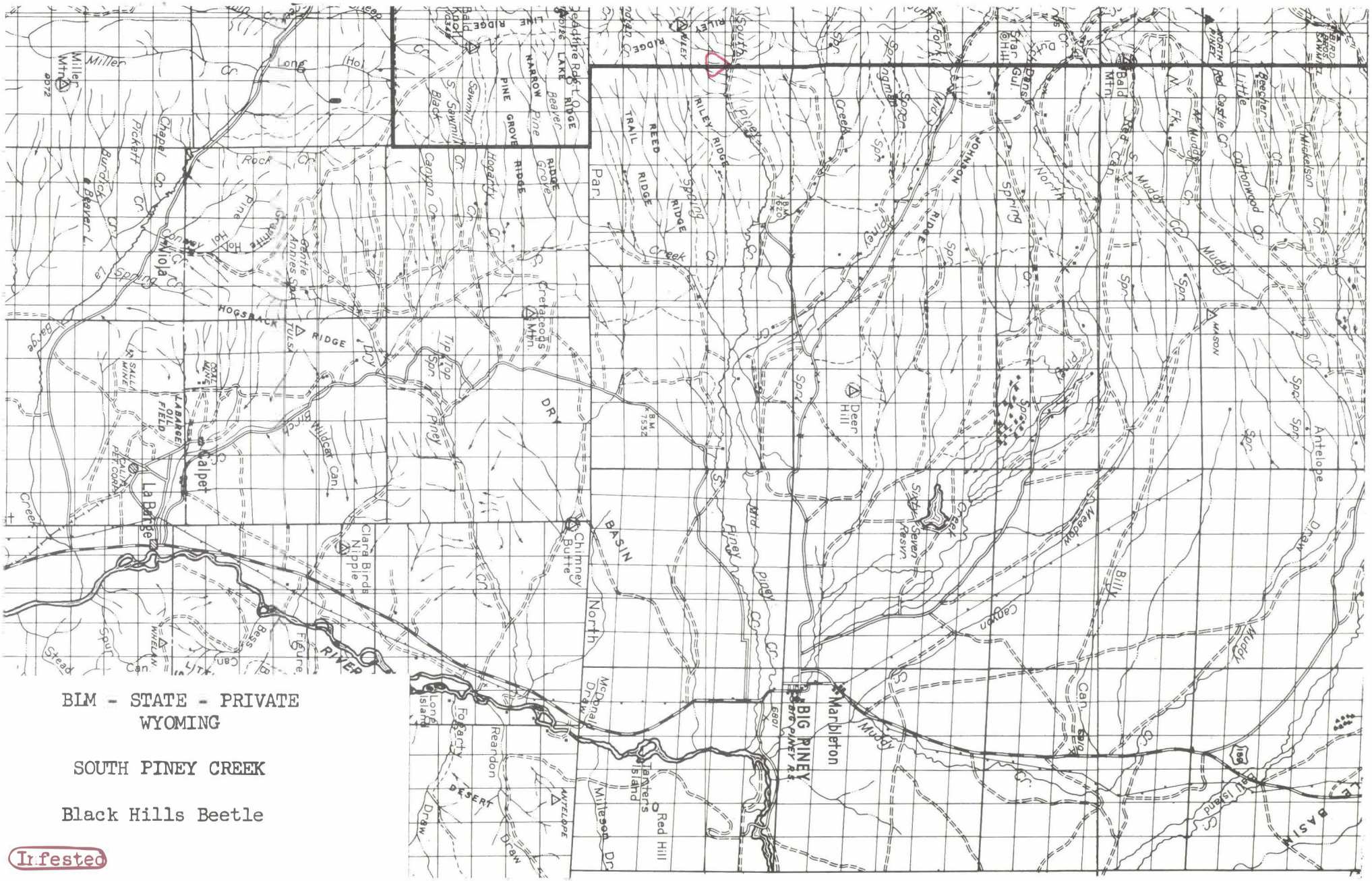
A small Black Hills beetle infestation of approximately 100-150 infested lodgepole pine on about 300 acres south of Rock Springs, Wyoming, near Brown Parks in the Three Corners area, was reported by Bureau of Land Management personnel. Ground evaluations showed the infestation to be in a more or less static condition with a probable decreasing trend. Brood densities were low, averaging 167.2 per square foot. Attacks averaged 8.8 with 65.2 inches of gallery per square foot. Buildup ratio of "red tops" to newly attacked trees was less than 1:1. The ratio of trees "pitched out" to trees successfully attacked was 1:3.

The timber on the Little Mountain area is more or less isolated and is some distance from other lodgepole pine type that could become infested. About 70 percent of the timber type is alpine fir. Sixty to seventy percent of the lodgepole pine is pole sized and would not serve as suitable host material for the Black Hills beetle. Entomologically, control action is not warranted.

South Piney Creek

The Black Hills beetle infestation in lodgepole pine reported last year in South Piney Creek, west of Big Piney, Wyoming, appears to be at a static level and may be decreasing. Brood averaged 201 per square foot, but the buildup ratio has dropped to one new attack for each tree killed last year. This infestation does not appear to be as aggressive as most other Black Hills beetle infestations in lodgepole pine in Region Four. At present no suppressive action appears necessary. The infestation will be evaluated again next year to determine if the downward trend continues.


NATIONAL
FOREST
Bacon
Mosquito Lake
Brewster L.
Triangle Pk.
Double-Top Pk.
Hodges Pk.
Tosi Creek Basin
Gros Ventre (TOSI)
Tepee Creek
Tosi Cr.
Ridge
Klondike Hill
Little Sheep Mt (BIG BEND)
Gypsum Park
Waterdog Lakes
Pass Pk
Twin Cr. Basin
Bartlett Cabin
Rock Creek Buttes
Kendall R.S.
Whiskey Cr.
Eagle Cr.
Red Hill
Battleship Mtn
Big Sheep Mt.
Gypsum Mtn.
Saltlick Mt.
Jim Cr. G.S.
Lodge Pk.
Showers R.
Lower Boulder Basin
Upper Boulder Basin
Doubletop Mt.
Dome Pk.
Newfork Lookout
Black Butte
Macroft R.
Faler R.S.
R.112W.
N. Rim
Dressler R.
Culbertson R.
Kismet Pk.
Signal Hill
Beaver
Guide
Middle Beaver
Cow Gulch
South Beaver Cr.
Aspen Ridge
North Hay Ridge
Green River
Warren Bridge Store
Bronx
Fourth of July
Forty Rod Flat
Cora
Daniel
Infested
New Fork Lakes
Willow Cr. Lookout
Flattop Mt.
Alexander
Lozier R.
Willow Lake
Jenkins
Binning
Soda Lake
Raspberry Ridge
Sandrock Cr.
Sour Moose Cr.
Rimdraw Cr.
Winers Cabin
Lodge Pole
Horse Spr.
Ryegrass Spr.
Prairie Cr.
Brodie
Game Patrol Cabin
Mud L.
Roaring Fork
Roaring Basin
Brook L.
Lime Cr.
Big Twin Cr.
Twin Cr.
Gypsum Cr.
Jim Cr.
Lake Cr.
Rock Cr.
Moose Cr.
Ridge Cr.
Bacon Ridge
Elk Ridge
Rock Ridge
Pinon Ridge
Quizel Falls
Dunch L.
Tarwin Pk.
Timber Cr.
Pinon Cr.
Mud L. Cr.
Roaring Fork
Bowlsbys R.
Basin Cr.
Fork
Squ
Ke
Hi
Rainbow
Willow Cr.
Lookout
Flattop Mt.
Willow Cr. G.S.
Alexander
Lozier R.
Willow Lake
Jenkins
Binning
Soda Lake
Cora
Daniel
Prairie Cr.
Brodie
Ryegrass Spr.
Horse Spr.
Dr.
Fork
Rod
Flat
Forty
Fourth of July
Bronx
Warren Bridge Store
Aspen Ridge
Green River
North Hay Ridge
Middle Beaver
Cow Gulch
South Beaver Cr.
Guide
Beaver Cr.
Culbertson R.
Dressler R.
Kismet Pk.
Signal Hill
Faler R.S.
R.112W.
N. Rim
Macroft R.
Black Butte
Newfork Lookout
Lower Boulder Basin
Upper Boulder Basin
Doubletop Mt.
Dome Pk.
Showers R.
Jim Cr. G.S.
Lodge Pk.
Saltlick Mt.
Battleship Mtn
Big Sheep Mt.
Gypsum Mtn.
Red Hill
Eagle Cr.
Whiskey Cr.
Kendall R.S.
Waterdog Lakes
Pass Pk
Twin Cr. Basin
Bartlett Cabin
Rock Creek Buttes
Little Sheep Mt (BIG BEND)
Gypsum Park
Brook L.
Klondike Hill
Tosi Creek Basin
Gros Ventre (TOSI)
Tepee Creek
Tosi Cr.
Ridge
Hodges Pk.
Double-Top Pk.
Brewster L.
Triangle Pk.
Bacon
Mosquito Lake
Timber Cr.
Pinon Cr.
Mud L. Cr.
Roaring Fork
Roaring Basin
Game Patrol Cabin
Lime Cr.
Big Twin Cr.
Twin Cr.
Gypsum Cr.
Jim Cr.
Lake Cr.
Rock Cr.
Moose Cr.
Ridge Cr.
Bacon Ridge
Elk Ridge
Rock Ridge
Pinon Ridge
Quizel Falls
Dunch L.
Tarwin Pk.


Miller Mtn.
Miller Cr.
Long Cr.
Rock Cr.
Pickett Cr.
Burdick Cr.
Chapel Ch.
Beaver L.
Beaver Cr.
Spring Cr.
Canyon Cr.
Hogarty Cr.
Andes Spr.
Cattle Hol.
Pine Grove
Narrow Pine Ridge
Sawmill Cr.
Black Hills Pipeline
Bald Mtn.
Reed Ridge
Riley Ridge
Riley Trail
Hogsback Ridge
Tulsa
Dry
Tip Top Spr.
Piney
Wildcat Can.
Cretaceous Mtn.
Deer Hill
Seven Pasen
Meadow
Antelope
Billy
Canyon
Muddy
Mid Piney
Piney Cr.
Piney Creek
South Piney
North Piney
Fk.
Mud Cr.
Red Castle Cr.
Cottonwood Cr.
Beecher
Little
Nickelson
Johnson
Mason
Bird Canyon
Ear Gul.
Par
Sawmill
Black
Hol
Creek
Spr
Spring
Ridge
Grove
Trail
Reed
Riley
Basin
North
Dry
Tip Top
Hogsback
Tulsa
Cretaceous
Deer
Seven
Meadow
Antelope
Billy
Canyon
Muddy
Mid
Piney
Cr.
Fk.
Mud
Red Castle
Cottonwood
Beecher
Little
Nickelson
Johnson
Mason
Bird
Canyon
Ear

BLACK HILLS BEETLE.

CACHE NATL. FOREST.

1) TREATED BY FORCE ACCOUNT CREWS.

2) FULL BREED DENSITY 145 SQ/FT. 180. LAST EPIDEMIC. NO TREES ACCOUNTABLE?

a) WHAT CONSTITUTES A SAMPLE? HOW MANY TREES, SIZE OF TREE, ETC.

CARIBOU NATL FOREST.

1) RATIO OF NEW (BUILD-UP) TO OLD (RED TOPS) 3:1. WHAT DOES THIS INDICATE.

2) ATTACKS SQ FT. (~~SPRING COUNTS~~ SUMMER COUNTS?).

3) WHO MAKES SURVEY FOR BUILD-UP RATE, NEW ATTACKS, PITCH-OUTS, ETC.

4) ENTOMOLOGISTS ESTIMATE APPROX 6000 NEWLY ATTACKED TREES. HOW DONE?

5) HOW ARE EVALUATION SURVEYS CONDUCTED.

% SAMPLE, TYPE OF PLOT, METHOD OF CRUISING, ~~LEDGE~~ ETC.

6) IN TABLES LAST COLUMN LISTED TREAD E.I. 79,600 ETC. WHAT IS CATCH, NO-EXPECTED TREES ATTACKED?

WYOMING Page 21

1) GROUND EVALUATIONS THIS FALL (1964) SHOWED A ROUGH ESTIMATE OF 39,000 - 40,000 LODGEPOLE PINE CURRENTLY INFESTED ON 10,000 - 15,000 ACRES.

DISCUSSION

Black Hills beetle infestations are subject to many changing forces between the time the fall evaluations are made and beetle flight takes place the following summer. Some of the occurrences of the last few years that affected population survival and densities are: parent adults have emerged and reattacked, parent females have resumed egg laying and have extended parent galleries, overwintering progeny have been drastically reduced by extremely low temperatures to localized "cold belts." In other cases survival was greater than ordinary. Rapid drying of cambium tissue in the spring has caused considerable brood mortality, and, of course, predators and parasites have caused variations in spring and summer bark beetle population densities. Thus, it is paramount that infestations need to be evaluated repeatedly to avoid unnecessary expenditure of control funds and to disclose outbreaks that are developing faster than fall evaluations indicated. In an area subject to sudden, widespread buildups of infestations such as Region Four, manpower for evaluations is always short. To improve the efficiency of evaluation work the entomologists of the Division of Timber Management cooperated with Walter E. Cole of the Intermountain Forest and Range Experiment Station in the development of a series of sequential sampling tables. Tables were developed for sampling egg, larvae, pupae, and adult stages of the Black Hills beetle in lodgepole pine. The object of the tables is to determine when sufficient sampling is done to be representative of the total. Thus, oversampling is eliminated and manpower and money saved. The tables were tested this year and will be tested again next year to determine the validity of this possible shortcut method of sampling.

Time was insufficient this year to evaluate all infestations. It was necessary, therefore, to lean heavily on the entomologist's judgment in some cases. In others that could not be visited, it is impossible to predict the infestation potential. Some risk is involved, therefore, in deciding for or against control, especially this year, when conditions are so varied; i. e., some outbreaks are dying out through natural causes or a combination of control and natural factors, other outbreaks have developed explosively, and still others seem to be lying in the balance between epidemic and endemic conditions. Undoubtedly some infestations not evaluated, are serious and should be treated while still small. At the same time not all infestations need treatment.

Accurate, up-to-date information on conditions of outbreaks and reliable predictions of insect population trends are necessary to the land manager for planning control strategy. As an example, information that explosive buildups are to occur in many centers in a large stand of pure lodgepole pine with the potential of coalescing into a large scale outbreak will enable the land manager to develop a coordinated long term, effective suppressive program.

Evaluations can supply biological data to show that outbreaks may develop to such a large scale that all-out control is impractical. In

such cases, a detailed knowledge of the biological factors involved in the population explosion can be useful in establishing areas that can be left untreated. In these cases, however, the evaluators should to the best of their ability predict what losses can be expected if large infestations are allowed to run their natural course.

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